Operator's Manual

INTERNATIONAL CUB LO-BOY Tractor

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Ave. Chicago 1, Illinois, U. S. A.

TO THE OWNER

The purpose of this manual is to assist you in realizing the benefits you anticipated when you purchased this International Harvester product. Literally thousands of people have contributed to the design and production of this product and its delivery to you. They have an interest in its successful performance and have provided this manual to give you the benefit of the experience they have gained through years of field testing and normal usage of this and similar products.

The way you operate and the care you give this product will have much to do with its successful performance. This manual has been carefully prepared and the information arranged and illustrated to make it as easy as possible for you to find the information you wish. It will pay you to read the entire manual carefully before operating and keep it handy for future reference. Your International Harvester Dealer will be glad to answer any further questions you may have on the operation or care of this product.

It is the policy of International Harvester Company to improve its products whenever it is possible and practical to do so. We reserve the right to make changes or add improvements at any time without incurring any obligation to make such changes on products sold previously.

All illustrations and descriptive matter in this publication apply to International Harvester products sold under the International, McCormick, McCormick-International, McCormick-Deering, or McCormick-Deering International trade name.

As a member of the National Safety Council, we are privileged to use the Green Cross for Safety to designate not only our interest in Safety, but to point out more clearly the safety precautions in this manual.

SERVICE

☐ International Cub Lo-Boy

DEALER'S COPY

DELIVERY REPORT

(This copy to be filed by dealer.)

Tractor Serial No. _____ (See Illust. 2A)

Engine Serial No. _____ (See Illust. 2B)

Delivered to _____ Purchaser's Name

Address _____ Street and No. or R.F.D. and Box No.

_____ Town

_____ State

_____ Date 19__

Tractor being replaced if any:

Make _____ Age _____ (Years) Model _____

Number tractors owned, including new purchase _____

Check the Major Use Only for this tractor and complete information under heading:

☐ **AGRICULTURAL**

1. Acres or hectares in crops _____

2. Check chief source of farm income: Dairy ☐ Corn ☐ Truck ☐ Orchard ☐ Livestock ☐ Wheat ☐ Cotton ☐ Other ☐

☐ **COMMERCIAL**

1. Type work _____

2. List below special duty equipment to be used:

Equipment _____ Make _____ Model _____

Equipment _____ Make _____ Model _____

PREDELIVERY SERVICE

Prior to delivery of the above tractor the following checks and tests were made and corrective action taken as necessary:

- ☐ Shortage or Damage in Shipment
- ☐ Extra Equipment and Accessories Checked Against Purchase Order
- ☐ Tire Pressures
- ☐ Engine Oil Level
- ☐ Air Cleaner Oil Level
- ☐ Transmission and Differential Oil Levels
- ☐ Steering Housing Oil Level
- ☐ Cooling System Level
- ☐ Water Level and Gravity of Battery Checked When Installed
- ☐ Engine Oil Pressure
- ☐ Cranking Motor
- ☐ Generator Charging
- ☐ Lights
- ☐ Engine Clutch
- ☐ Brakes
- ☐ Torque Cylinder Head—Engine Hot
- ☐ Engine Operation
- ☐ Gear Shifting—All Speeds
- ☐ Road Test for General Operation
- ☐ Inspect Hydraulic System Fluid Level and Operation*
- ☐ Clean and Polish

DELIVERY SERVICE

At time of delivery the importance of the Operator's Manual was explained and, with it as a guide, instruction was given as indicated by check marks:

- ☐ Precautions with New Tractor
- ☐ Lubricating Entire Tractor
- ☐ Fuel and Lubricant Specifications
- ☐ Checking Oil Levels
- ☐ Care of Air Cleaner and Breathers
- ☐ Servicing Oil Filter
- ☐ Starting, Stopping, and General Operation
- ☐ Drawbar Adjustment
- ☐ Safe Hitching Practices
- ☐ Care of Cooling System
- ☐ Care and Use of Hydraulic System*
- ☐ Fast-Hitch Operation*
- ☐ Care of Fuel System
- ☐ Adjustment of Engine Clutch
- ☐ Care of Ignition System
- ☐ Care of Generator
- ☐ Care of Battery
- ☐ Adjustment of Brakes
- ☐ Tires—Inflation, Weighting, Care
- ☐ Wheel Weights and Tread Adjustment
- ☐ Cold Weather Operation
- ☐ Storing Tractor
- ☐ Starting Tractor After Storage
- ☐ Caution Regarding High-Speed Operation
- ☐ Tightening Nuts and Bolts
- ☐ Keeping Tractor Clean

*When So Equipped.

The customer's signature below certifies that the tractor was delivered to him in a satisfactory condition and that he received instruction as to its proper operation and maintenance.

Appointment for after-delivery inspection (10 to 30 days after) was made for _____ Date

Signed _____ Customer

By _____

Signed _____ Dealer

By _____

CUSTOMER'S SERVICE RECORD

After–delivery inspection made ______________________
Date

JOB No.	DATE	BRIEF DESCRIPTION OF SERVICE PERFORMED

RECORD OF CONTACT

Symbols— C - Called on T - Telephone L - Letter

DATE	SYM	REMARKS	DATE	SYM	REMARKS	DATE	SYM	REMARKS

SERVICE

☐ International Cub Lo-Boy

DELIVERY REPORT

(This copy to be sent to International Harvester District Office.)
(EXPORT—Send to Distributor or Affiliate General Office.)

DISTRICT OFFICE COPY
(EXPORT—DISTRIBUTOR OR AFFILIATE OFFICE COPY)

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Engine Serial No._____ (See Illust. 2B)

Delivered to_____ Purchaser's Name

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_____ Town

_____ State

_____ Date 19___

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Signed_____ Customer

By_____

Signed_____ Dealer

By_____

A Careful Operator

IS THE BEST INSURANCE

AGAINST AN ACCIDENT

—*National Safety Council.*

☐ International Cub Lo-Boy

OWNER'S COPY

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(This copy to be retained by owner.)

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By _____

By _____

CONTENTS

INTRODUCTION

Assembled in this book are operating and maintenance instructions for the International Cub Lo-Boy Tractor. This material has been prepared in detail in the hope that it will help you to better understand the correct care and efficient operation of your tractor.

If you should need information not given in this manual, or require the services of a trained mechanic, get in touch with the International Harvester dealer in your locality. Dealers are kept informed on the latest methods of servicing tractors. They carry stocks of IH parts, and are backed in every case by the full facilities of a nearby International Harvester District Office.

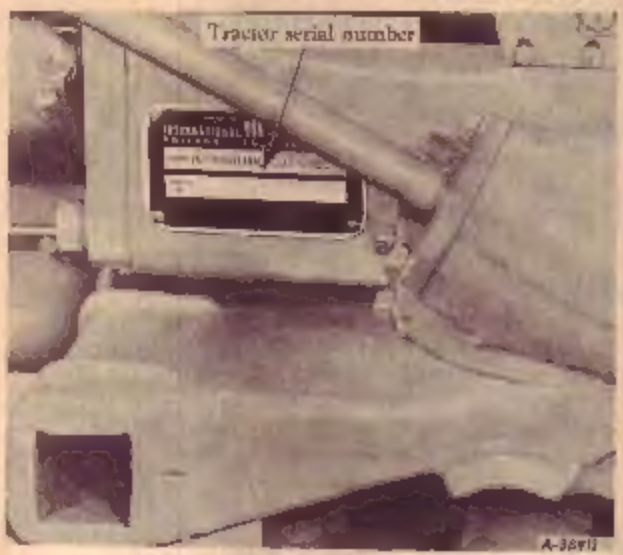
Throughout this manual the use of the terms LEFT, RIGHT, FRONT and REAR must be understood to avoid confusion when following instructions. LEFT and RIGHT indicate the left and right sides of the tractor when facing forward in the driver's seat. Reference to FRONT indicates the radiator end of the tractor; to REAR, the drawbar end. *See Illust. 2.*

Illust. 2

The illustrations in this manual are numbered to correspond with the pages on which they appear; for example, *Illusts. 7 and 7A are on page 7.*

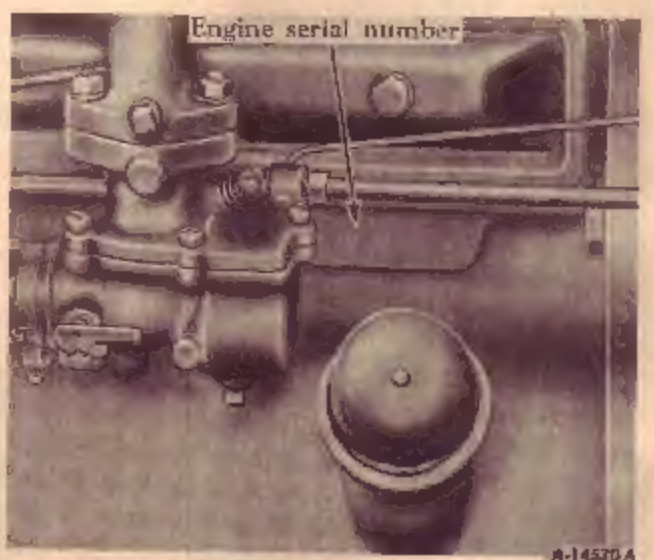
A variety of special equipment is available for use with this tractor. The instructions for operating and maintaining the special equipment have been included in the instructions for operating and maintaining the tractor. Disregard the instructions for special equipment not on your tractor.

When in need of parts, always specify the tractor and engine serial numbers. The tractor serial number is stamped on a name plate attached to the steering gear housing on the right side of the tractor. *See Illust. 2A.*



Illust. 2A
Location of tractor serial number.

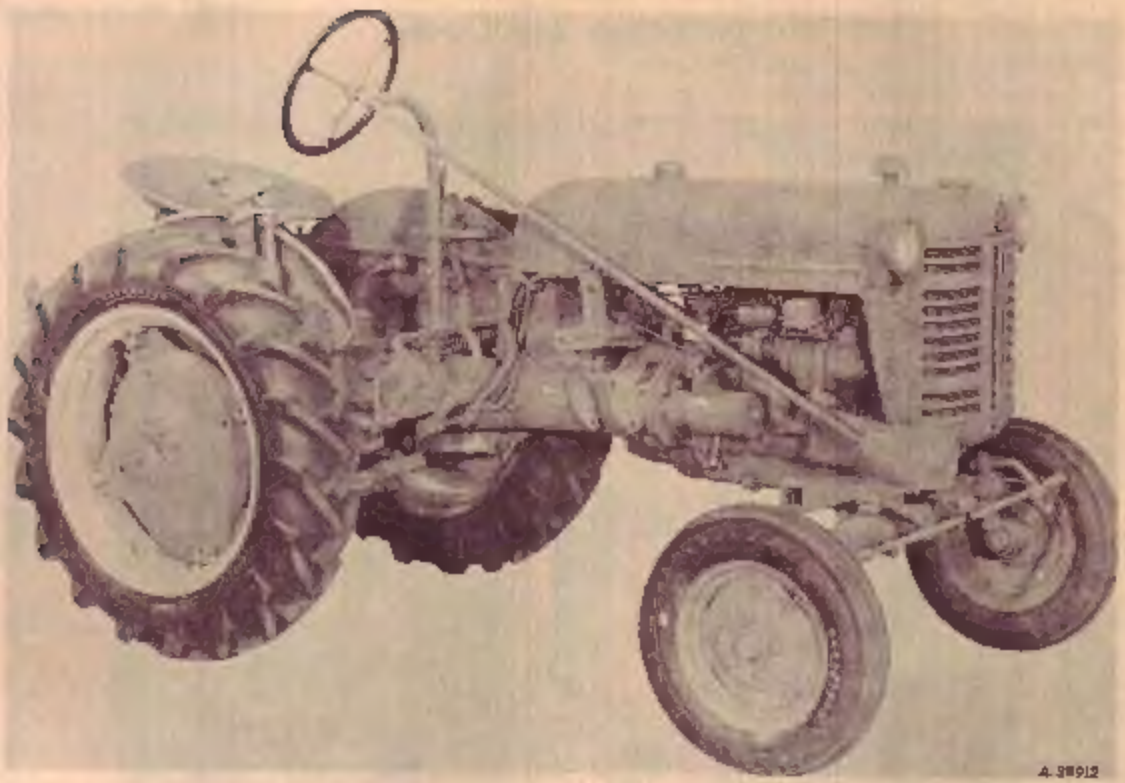
The engine serial number is stamped on the left side of the engine crankcase to the right of the carburetor. This serial number is preceded by the letters FCUBM. *See Illust. 2B.*



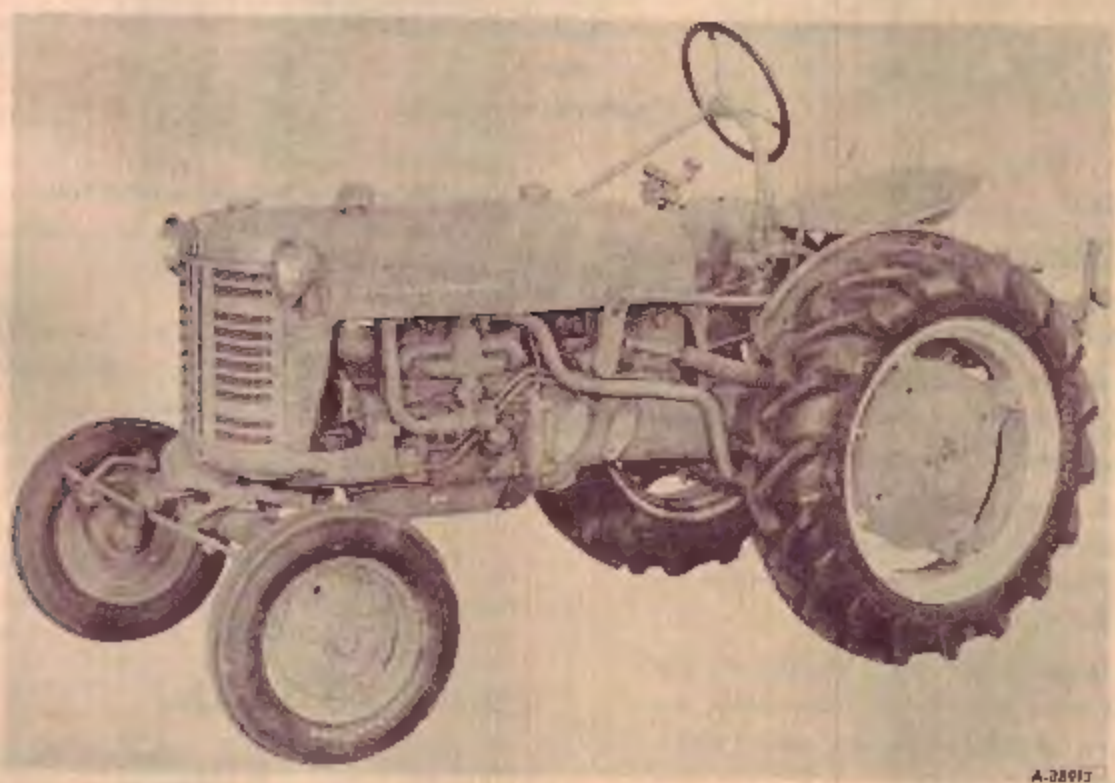
Illust. 2B
Location of engine serial number.

For ready reference, we suggest that you write these serial numbers in the spaces provided on the Delivery Report.

DESCRIPTION



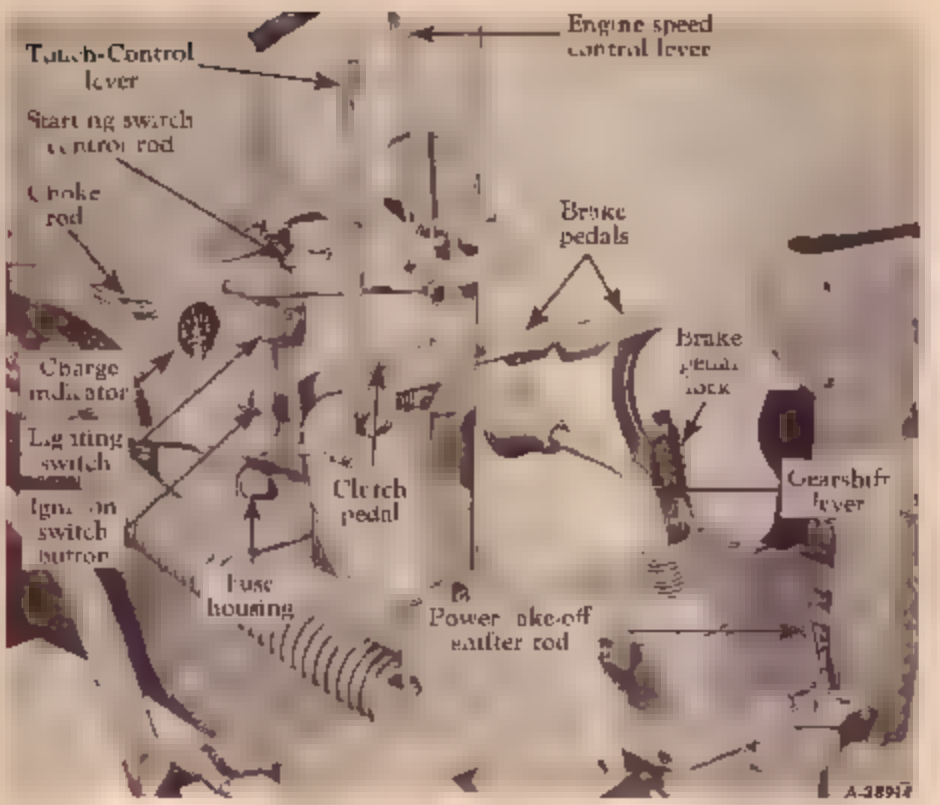
Illust. 3
Right front view.



Illust. 3A
Left front view.

DESCRIPTION

Instruments and Controls



Illust. 4

Location of controls

Brake Pedals

These pedals are used to stop the tractor, to hold the tractor in a stationary position, or to assist in making sharp turns as outlined below:

To stop the tractor, latch the pedals together so both brakes will operate simultaneously when the pedals are pressed down.

To hold the tractor in a stationary position, latch the pedals together, depress and lock them in this depressed position by using the brake pedal lock.

To assist in making a sharp turn, the pedals must be operated individually, depressing the pedal on the side toward which the turn is to be made.

The brake pedal latch (located behind the left-hand brake pedal) is used to latch both brake pedals together, causing the brakes to operate simultaneously.

The brake pedal lock (*Illusts. 4 and 58A*) is used to lock the brake pedals in the depressed position. This prevents the tractor from moving.

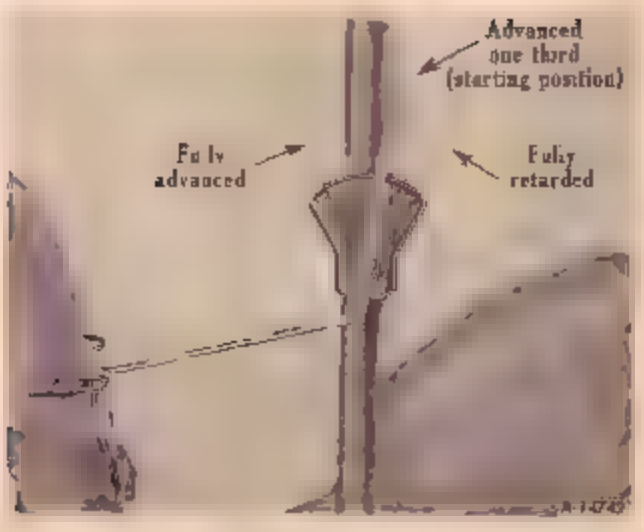
Clutch Pedal

This pedal, when depressed all the way, disengages the engine from the transmission.

Starting Switch Control Rod

To start the engine, adjust the choke rod and pull out on the starting switch control rod as explained *on page 8*.

Engine Speed Control Lever



Illust. 5
Various positions of the engine speed control lever

This lever controls the speed of the engine and, when set in a given position, will maintain a uniform engine speed even though the engine load may vary.

The rated or maximum full load governed speed is 1,800 r.p.m.; maximum idle speed is approximately 2,016 r.p.m., minimum speed (hand throttle) is 450 to 500 r.p.m. Never operate the engine at more than the regular, governed speed. Excessive speeds are harmful.

Governor

The governor is set at the factory and should require no adjustment. Consult your International Harvester dealer if the governor does not function properly.

Choke Rod

The choke rod is a part of the Electric Starting Attachment, and makes possible the regulation of the carburetor choke from the driver's seat. Pulling out on the choke rod closes the carburetor choke for starting the engine, pushing it back in opens the choke.

Carburetor Choke Lever

The carburetor choke lever controls the air supply to the carburetor. When the choke lever (*Illusts. 8 and 9*) is moved up all the way (closed position) the air supply is cut off, thereby enriching the fuel mixture for starting the engine. If your tractor is not equipped with the electric starter and choke rod, move the choke lever up all the way before cranking the engine. Moving the choke lever back down opens the choke for normal engine operation.

Ignition Switch Button

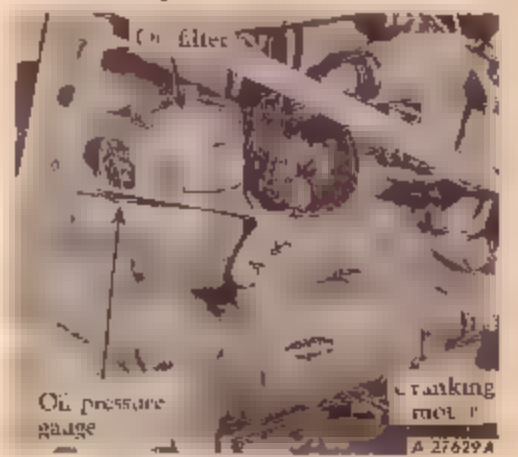
This button closes and opens the electrical circuit for operating and stopping the engine. Pull the button out for operating and push it in to stop the engine.

Caution! On tractors with battery ignition, when the engine is not operating or the engine has stalled and the operator leaves the tractor, the ignition switch button must be pushed all the way in, so that the switch is in the off position, to prevent battery discharge.

Lighting Switch

The lighting switch has three positions. "O"—off position, "D"—dim lights, and "B"—bright lights.

Oil Pressure Gauge

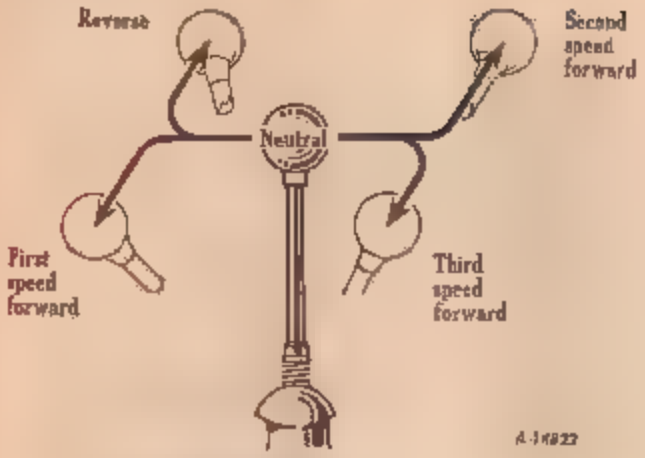


Illust. 5A
Location of oil pressure gauge

This gauge (*Illusts. 5A and 5B*) indicates whether lubricating oil is circulating through the engine. The indicator needle should be past the first mark above zero when the engine is running at speeds approximately 100 r.p.m. above slow idle speed. *See Illust. 5B.* If the needle does not move past the first mark above zero, stop the engine immediately and investigate the cause of the oil pressure failure. If you are unable to find the cause, consult your International Harvester dealer before operating the engine.

Illust. 5B
Oil pressure gauge

Gearshift Lever



Ilust. 6
Gear shifting positions

This lever is used to select various gear ratios provided in the transmission. There are three forward speeds and one reverse speed. *See Illust. 6.*

Charge Indicator

Illust. 6A
Charge indicator

This instrument indicates the charging rate of the generator or discharge rate of the battery. If it shows discharge continuously, investigate the cause to avoid completely discharging the battery and possible damage to the generator. *See pages 48 to 56* for additional information on electrical equipment.

Belt Pulley and Power Take-Off Shifter Rod

The shifter rod is used to engage or disengage the belt pulley or the power take-off. *Refer to pages 12 to 14* for operating instructions.

Before Starting Your New Tractor

Lubrication

Lubricate the entire tractor, using the *"Lubrication Guide."*

Check the oil levels of the engine crankcase, air cleaner, transmission, belt pulley housing and all gear cases to see that they are filled to the correct levels with oil of the proper viscosity for the prevailing temperature. *Refer to "Lubrication Guide"* and the specifications of lubricants *on page 24.*

Tractors shipped to destinations in the United States of America, Canada and Mexico have the crankcase and air cleaner filled with an SAE-10W rust inhibited engine oil. This oil, which is primarily a preservative oil, may be used on light and medium loads at temperatures below 80° F. for the first 120 hours of operation. If temperatures are above 80° F. or the unit is to be used on heavy loads, drain the oil from the crankcase and air cleaner and replace it with the required amount of fresh oil having the physical properties and proper viscosity grade suitable for the prevailing temperature and type of service.

Note: After the first oil change, the crankcase oil and the oil filter element may be used up to 150 hours of operation under normal operating conditions. *Refer to the "Lubrication Guide" and the "Lubrication Table."*

Tractors packed for export have all oil drained from the engine crankcase, air cleaner and all gear cases.

Before starting the engine for the first time, remove the spark plugs and put about one teaspoonful of crankcase oil into each cylinder; replace the spark plugs and crank the engine to distribute the oil over the cylinder walls. This assures positive lubrication of the cylinders and pistons immediately after starting and eliminates the possibility of scoring.

Pneumatic Tires

Before moving the tractor, check the air pressure in the pneumatic tires and inflate or deflate the front tires to 20 pounds and the rear tires to twelve pounds. Refer to the table *on page 62* for more complete information.

Engine Cooling System

The cooling system capacity is approximately 9¾ U.S. quarts.

Be sure the drain plug underneath the radiator is closed. *See Illust. 34A.*

Fill the radiator to a level slightly below the bottom of the filler neck. Filling the radiator to this level will allow for expansion of the coolant under normal operating conditions. Use clean water; soft or rain water is recommended, as it does not contain alkali which forms scale and eventually clogs the passages.

For further information, *see "Cooling System" on pages 33 to 36.* If the tractor is to be operated in freezing temperatures (+32°F. or lower), *refer to "Cold Weather Precautions" on pages 32 and 33.*

Fuel System

International Harvester gasoline burning engines are specifically designed for use with regular grade gasoline having an 86 minimum octane rating (Research Method—approximately 80 Motor Method).

Use a good grade of clean gasoline.

During the first 100 hours of operation, mix one pint of light engine oil with every five U. S. gallons of fuel.

Battery-to-Ground Cable

Tractors shipped from the factory with starting and lighting equipment have the battery-to-ground cable (*Illust. 47*) disconnected and taped. Therefore, before attempting to start the engine, be sure that the battery-to-ground cable is connected to the ground.

Instruments and Controls

Thoroughly acquaint yourself with all instruments and controls as described *on pages 4 to 6.*

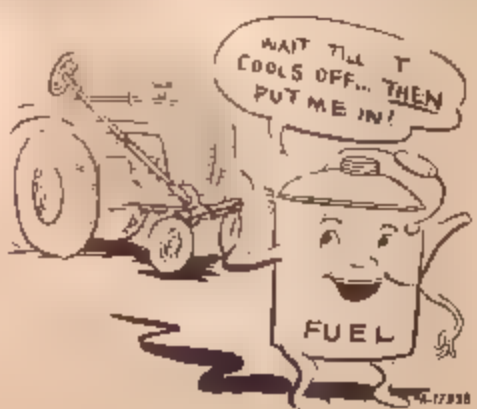
Preparing Your Tractor for Each Day's Work

Fuel System

Illust. 7

Filling the fuel tank

Fill the fuel tank (capacity 7½ gallons) with a good grade of clean gasoline, preferably at the end of each day's run. This will force out any moisture-laden air and prevent condensation in the fuel tank.



Never refuel the tractor while the engine is running or extremely hot.

Safety first! Never fill the fuel tank when the engine is running or when near an open flame; do not smoke or use an oil lantern when working around inflammable fuels. When pouring fuel, keep the hose nozzle in contact with the metal of the fuel tank (*Illust. 7*) to avoid the possibility of an electric spark igniting the gas. Do not light matches near gasoline, as the air within a radius of several feet is mixed with a highly explosive vapor.

The fuel tank filler cap has air vents. *See Illust. 7A.* Keep these vents open at all times to assure proper flow of the fuel.

Illust. 7A

Vent holes in filler cap.

Cooling System

Remove the radiator filler cap and check the water level. Fill to a level slightly below the bottom of the filler neck.

Lubrication

Air Cleaner

Change the oil in the air cleaner oil cup. Fill to the level mark with engine oil. Remove any dirt or chaff from the air cleaner cup.

Engine Crankcase

Check the oil level and, if necessary, add sufficient oil to bring the level up to the "FULL" mark on the bayonet gauge. *See Illust. 21. Also refer to "Lubrication Guide."*

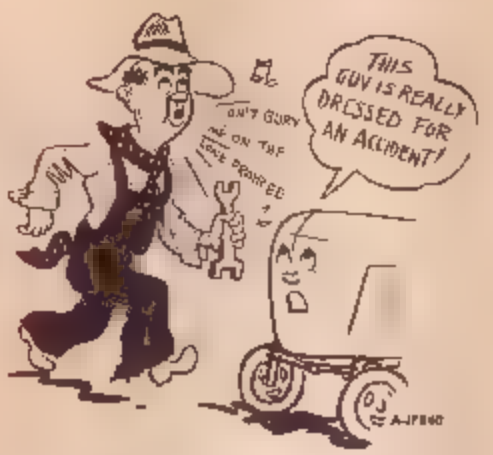
Lubrication Fittings—*Refer to "Lubrication Guide"* for complete daily lubrication requirements.

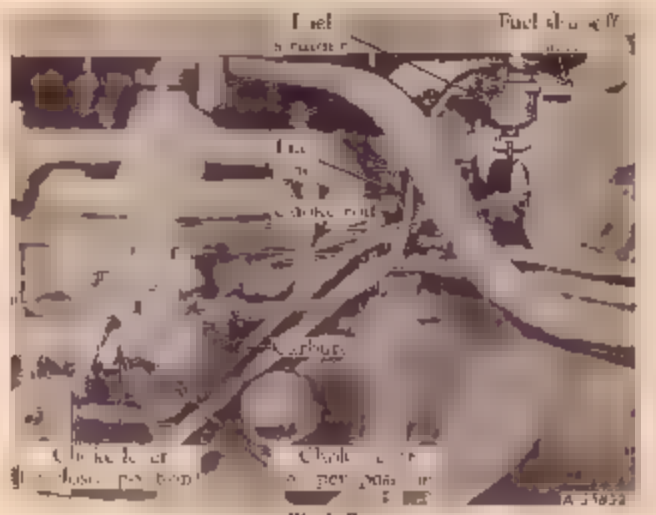
OPERATING YOUR TRACTOR

Before attempting to start or operate the tractor, be sure you review the instructions for a new tractor and thoroughly familiarize yourself with the instruments and controls.

Operating the Engine

This engine is designed to operate on gasoline with an 86 minimum octane rating (Research Method).



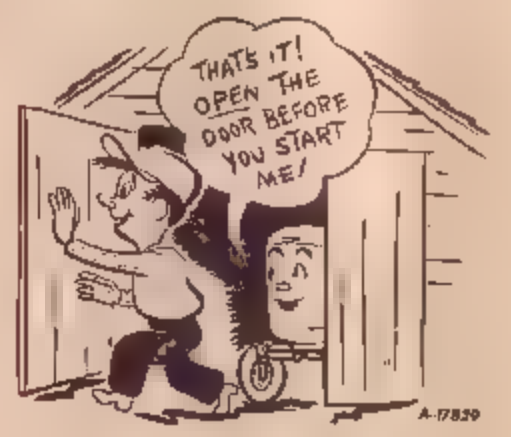


Illust. 3

Fuel system and controls

Fuel System

Check the fuel tank to make sure it is full, also see that the shut-off valve on the fuel strainer under the gasoline tank is open. To assure against leakage or seepage when the valve is in its full-open position, be sure to screw out the needle stem (shut-off valve) until the seat on the stem is tight against the stop.



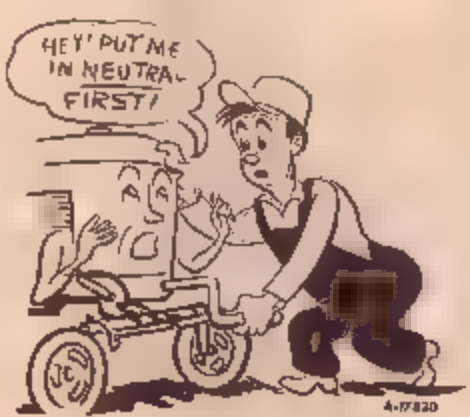
Starting the Engine with the Cranking Motor

1. Put the gearshift lever in the neutral position. *See Illust. 6.*

2. Pull the choke rod all the way out. *See Illust. 4.*

3. Advance the engine speed control lever one third. *See Illust. 5.*

4. Pull out on the ignition switch button. *See Illust. 4.*



5. Pull out on the starting switch control rod (*Illust. 4*) and release it as soon as the engine starts However, do not operate the cranking motor for more than 30 seconds at any one time. If the engine does not start within this time, release the starting switch control rod and wait a minute or two, then try again.

Hand-Cranking the Engine

1. Put the gearshift lever in the neutral position. *See Illust. 6.*

2. Close the choke by moving the carburetor choke lever all the way up. *See Illust. 9.*

Illust. 9

Closing the carburetor choke lever
(Tractors without cranking motor.)

3. Advance the engine speed control lever one-third. *See Illust. 5.*

4. Pull out on the ignition switch button. *See Illust. 4.*

5. Crank the engine until it starts. *See Illust. 9A.*

Avoid overchoking, as excessive use of the choke will flood the engine, making it hard to start. The use of the choke for starting will vary, depending on temperature and altitude

Caution! When cranking the engine, be sure that the gearshift lever is in the neutral position, and always stand in a position that will eliminate any possibility of being struck by the starting crank if there is a reversal of the direction

Illust. 9A

Correct method of hand-cranking.
(Tractors without cranking motor.)

of the engine. Crank the engine by using quick up-strokes; do not spin it.

After the Engine Starts

As soon as the engine starts, adjust the choke to a point where the engine operates without missing, and as the engine warms up, open the choke by gradually pushing the choke rod all the way in, or by moving the carburetor choke lever down all the way *See Illust. 8 and 10A.* Do not use the choke to enrich the fuel mixture, except when starting the engine.

Immediately after the engine starts, check the oil pressure gauge (*Illust. 8B*) to see whether lubricating oil is circulating through the engine. If it is not, stop the engine and inspect the oil system to find the cause of failure. If unable to find the cause, be sure to consult your International Harvester dealer before operating the engine

Stopping the Engine

Retard the engine speed control lever by pulling it all the way back (*Illust. 5*). Allow the engine to cool slowly from full-load operation by slowly idling the engine for a short time. Then push the ignition switch control button all the way in to stop the engine. It is advisable to close the gasoline shut-off valve if the engine is to be stopped for any length of time

OPERATING YOUR TRACTOR
Driving the Tractor

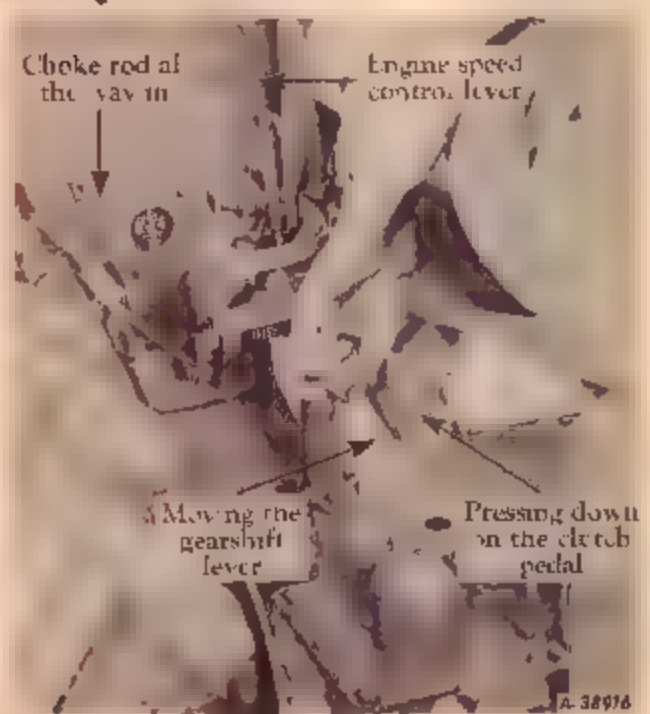
Adjusting the Seat

Before starting the tractor, adjust the seat to one of the four positions available to provide the most comfortable position for the operator

The seat is quickly and easily adjusted by changing the position of the four cap screws in the seat support bracket (*Illust. 10*) giving a total adjustment of 4⅜ inches. Tighten the cap screws securely when reassembling.

Illust. 10
Seat in the forward position

Starting the Tractor



Illust. 10A
Shifting the gears.

1. Advance the engine speed control lever slightly. *See Illust. 5.*

2. Disengage the clutch by pressing the clutch pedal all the way down.

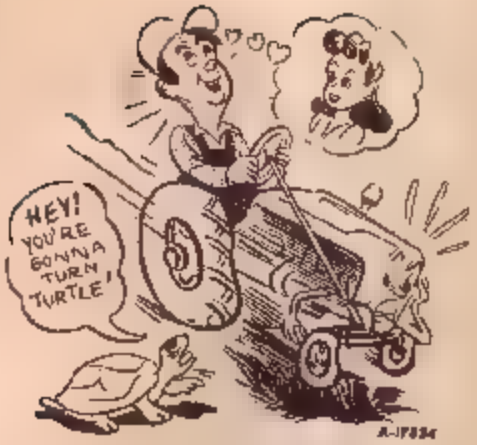
3. Hold the clutch pedal in this position and move the gearshift lever to the desired speed

4. Advance the engine speed control lever to a position where the engine operates best for the load to be handled

5. Start the tractor in motion by slowly releasing the clutch pedal. **Note:** Do not shift gears while engine clutch is engaged or while the tractor is in motion

6. Do not "ride" the clutch or brake pedals while driving the tractor, as this will result in excessive wear on the linings.

Always latch the brake pedals together before driving the tractor in high gear. To latch the pedals together, engage the latch (located in back of the left brake pedal) in the slot in back of the right pedal. *See Illust. 58A.* When the brake pedals are not latched together, latch "A" should rest in the slot in back of the left brake pedal *See Illust. 58.*

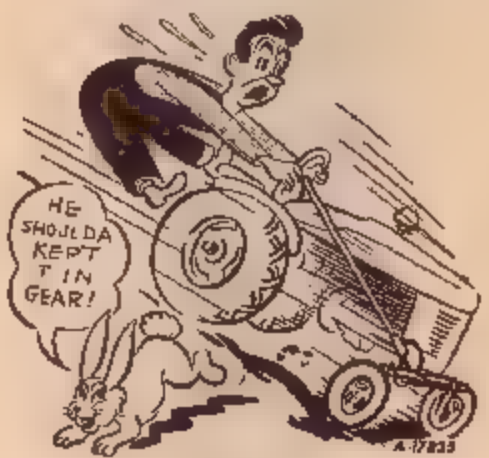


Be extra careful when working on hillsides. Watch out for holes or ditches into which a wheel might drop and overturn the tractor.

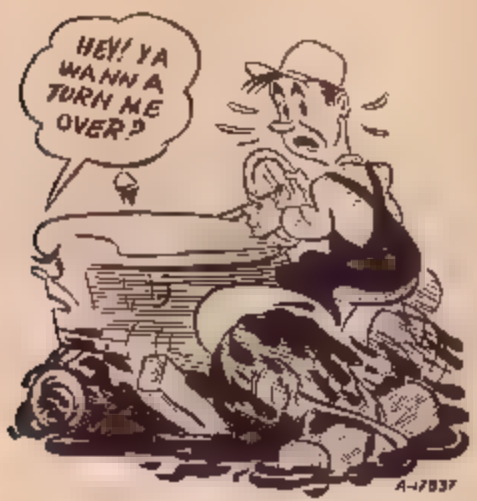
Always drive the tractor at speeds slow enough to insure safety, especially when driving over rough ground or near ditches.

Steering the Tractor

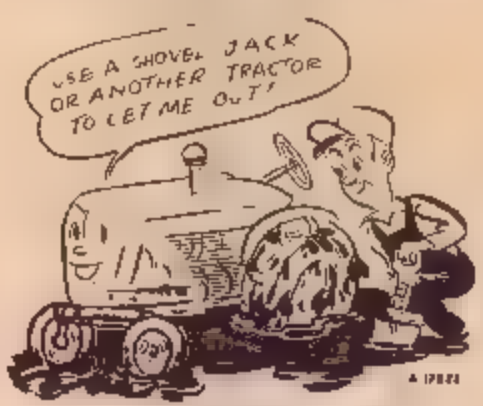
The tractor is steered in the conventional manner by means of the steering wheel, however, to make a sharp or pivot turn, press either the right or left brake pedal, depending on the direction in which the turn is to be made. The brake pedals must be unlatched so they can be operated individually



Always keep the tractor in gear when going down steep hills.



If the tractor will not move because the rear wheels have dug in or sunk deeply into the ground, don't fasten rags, posts, or anything to the rear wheels that will prevent them from rotating. This would be certain to tip the tractor over backward. Instead,



dig out or jack up the rear wheels and fill in under them. Or, if another tractor is available, hitch it with a chain around the front axle and steering gear housing base of the stuck tractor. The power of both tractors should be used, and a heavy pull must be kept on the chain at all times.

Towing the Tractor

When towing is necessary, use a rope, chain, or cable and have an operator steer the tractor and operate the brakes.

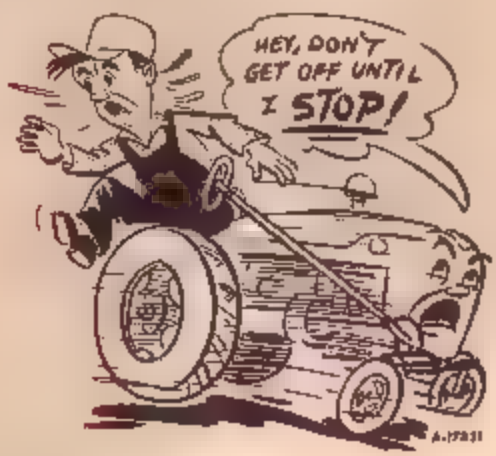
Attach a tow rope, chain, or cable around the front axle and steering gear housing When towing a tractor, do not exceed a speed of 20 miles per hour

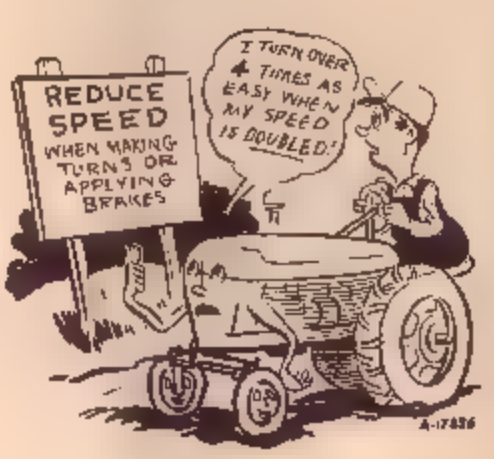
Stopping the Tractor

Disengage the clutch by pressing down firmly on the clutch pedal, and move the gearshift lever to the neutral position. Use the brakes if necessary

Locking the Brakes

Always lock the brakes when the tractor is parked on a grade or when doing belt work. To lock the brakes, first latch the brake pedals together with the latch as previously described. Now press down on the foot pedals; then place the brake pedal lock in the engaged position *as shown in Illust. 58A.* To disengage the lock, press down on the foot pedals and lift the lock "B" and place it in the disengaged position, against the right brake pedal. *See Illust. 58.*

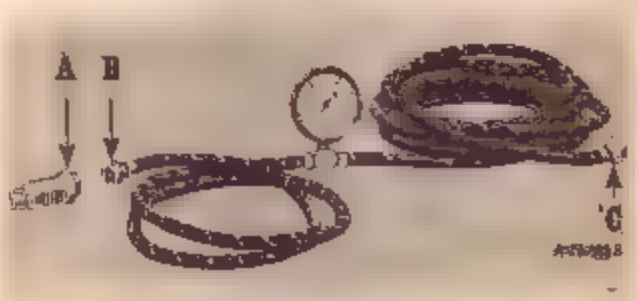




Operating the Pneumatic Tire Pump

Note: A carbureted engine must be used as the source of power

To operate the tire pump remove one of the spark plugs from the tractor engine, or any carbureted engine having the correct spark plug thread size, and replace it with pumping element "A," *See Illust. 12.* Attach one end "B" of the pump hose to the pumping element and other end "C" to the valve stem of the tire to be inflated. Start the engine and run it at low speed for maximum efficiency until the desired tire pressure is obtained



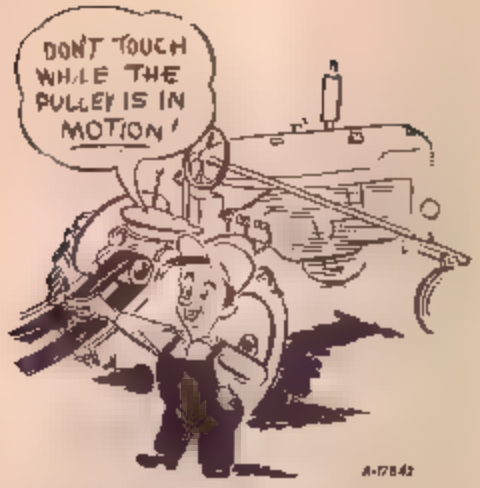
Illust. 12

Tire pump, hose and pressure gauge

Operating the Belt Pulley and Power Take-Off

If your tractor is equipped with a belt pulley or power take-off, the following instructions and precautions should be carefully studied and followed

The belt pulley and power take-off are started and stopped by the same engine clutch as the tractor. Be sure to disengage the engine clutch before moving



Don't put on or remove the belt from the belt pulley while the pulley is in motion

the belt pulley or power take-off shifter rod. The belt pulley is driven by the power take-off shaft, therefore, the same shifter rod is used to operate either the belt pulley or power take-off. The shifter rod should always be in the disengaged (forward) position (*Illust. 13*) when the belt pulley or power take-off is not in use.

Note: When the tractor is equipped with the Fast Hitch, the pull bar and support assembly must be disconnected and lowered to the ground by removing the pin "A" at the leveling screw housing and the pin "B" at the lateral link clevises. Then move the diagonal link to one side. *See Illust. 19.*

Operating the Belt Pulley or Power Take-Off with the Tractor Standing Still

1. The transmission gearshift lever must be in the neutral position.

2. Move the engine speed control lever back to low idle speed.

Always stop the power take-off before dismounting from the tractor

Illust. 13

Moving the belt pulley and power take-off shifter rod to the engaged position

3. Depress the clutch pedal to disengage the engine clutch.

4. Press down on the shifter rod (*Illust. 13*) and move it back to the engaged position. Release the shifter rod and allow it to lock in place.

5. Slowly release the clutch pedal.

6. Observe the following instructions when using the tractor belt pulley.

   a. Secure the implement to receive power in the desired location.

   b. Align the tractor belt pulley with the implement pulley. Keep the tractor level if possible.

   c. Observe the direction of belt travel indicated on the belt, and install the belt accordingly to prevent damaging it.

   d. Tighten the belt enough to prevent the belt from rubbing against itself during operation. Do this by driving the tractor into the belt, locking the brakes, and blocking the tractor rear wheels. (When using a very long belt or a crossed belt, it will not be possible to eliminate all rubbing.)

   e. Gradually bring the tractor engine up to speed, making sure the belt is running true.

Note: Static electricity generated by belt work can be discharged harmlessly by attaching a chain to the tractor and letting it touch the ground.

Operating the Power Take-Off with Tractor in Motion

Follow the first four steps outlined above; then release the power take-off shifter rod and allow it to lock in place. Keep your foot pressed down on the clutch pedal (in the disengaged position), advance the engine speed control lever and move the transmission gearshift lever to the speed that is desired to run the tractor. Slowly release the clutch pedal. This will start the tractor in motion with the power take-off in operation

When the power take-off shaft is not in use, always keep it covered with the power take-off shaft guard

Changing from Belt Pulley to Power Take-Off

Illust. 14

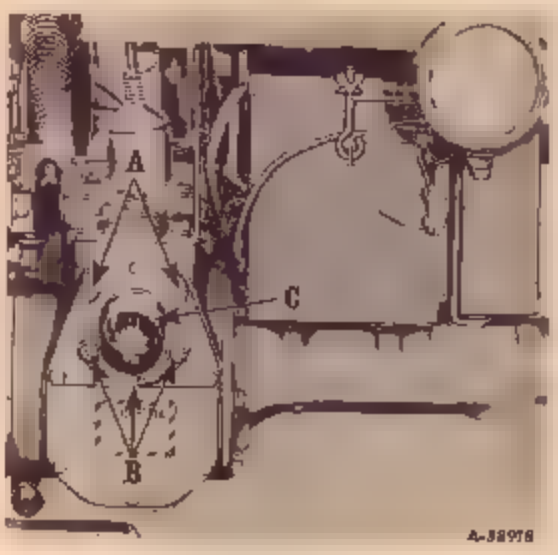
Belt pulley and power take-off assembled on tractor.

Remove two 3/8 N C x 1 5/8-inch cap screws "A" (*Illust. 14*) and three 3/8 N.C. x 1 3/8-inch cap screws "B" and remove the belt pulley and housing, complete. Set the belt pulley and cap screws aside for future use.

Replace the removed cap screws with the extra cap screws supplied with the belt pulley and power take-off attachment. Use two 3/8 N C. x 1 3/8-inch cap screws at "A" (*Illust. 14A*) and the three 3/8 N C x 1 1/8-inch cap screws at "B." Use flat washers in front of the lock washers and tighten the cap screws securely

Always cover the power take-off exposed shaft with the guard "C" (Illust. 14A) when the power take-off is not being used

The power take-off shaft speed is 1,800 r.p.m. (counterclockwise rotation).



Illust. 14A

Power take-off assembled on tractor

Changing from Power Take-Off to Belt Pulley

Remove two 3/8 N C. x 1 3/8-inch cap screws "A (*Illust. 14A*) and the three 3/8 N.C. x 1 1/8-inch cap screws at "B." Apply a light coating of grease to the power take-off shaft and female spline in the belt pulley housing. Then slide the belt pulley and housing complete on to the power take-off splined shaft

Insert the two 3/8 N.C. x 1 5/8-inch cap screws with lock washers at "A" (*Illust. 14*) and the three 3/8 N C. x 1 3/8-inch cap screws with lock washers at "B and tighten all cap screws securely

Check the lubricant in the belt pulley housing as instructed *in "Lubrication Guide" on page 29*

Static electricity, generated by belt work in tractors with pneumatic tires, can be discharged harmlessly by attaching a chain to the tractor and allowing it to touch the ground.

Belt Pulley Specifications

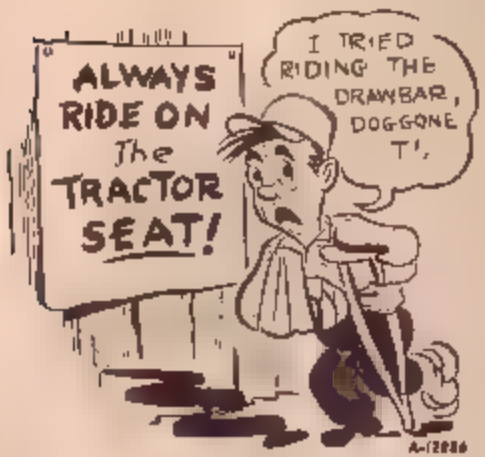
Diameter (Inches)	Face Width (Inches)	Pulley Speed (R.P.M.)	Belt Speed (Feet per Minute)
7 5/8	4 5/8	1,487	2,968
9	4 3/4	1,487	3,504
6	4 3/4	1,487	2,336

OPERATING YOUR TRACTOR

Hitching the Implement to the Tractor

(Tractors without Fast-Hitch)

> Do not attempt to pull when the drawbar is removed.
>
> Drawbar bolts must be kept tight.
>
> All hitches for trailing implements must be attached to the drawbar



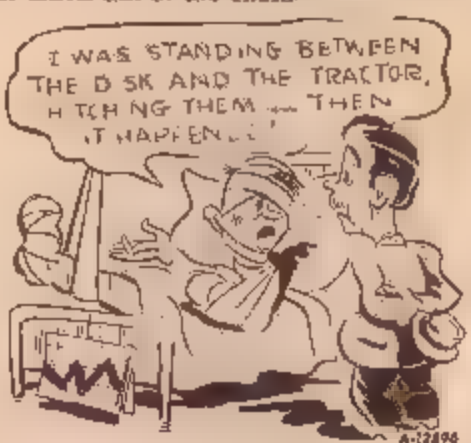
Always ride on the tractor seat when driving on the highway or to and from the field. Never ride on the tractor drawbar or on the drawn implement.

Only one person, the operator, should be permitted to ride on the tractor when it is in operation.

The tractor exerts its pulling power on pull-behind implements by means of the drawbar which is adjustable up and down to accommodate different hitches. Proper hitching will save both the tractor and the implement it is pulling from undue strains. Make the hitch so that the center line of pull of the tractor will fall in line with, or at least near the center line of draft of the hitched-on implement. Hitching to one side or the other of the line of draft will cause stresses and strains on both the tractor and the implement being pulled frequently great enough to do permanent damage. Incorrect hitching will also tend to make the tractor difficult to steer and will result in unsatisfactory work by the implement being pulled.

When using a long chain to hitch the tractor to the load, drive the tractor forward slowly until all slack is taken out of the chain.

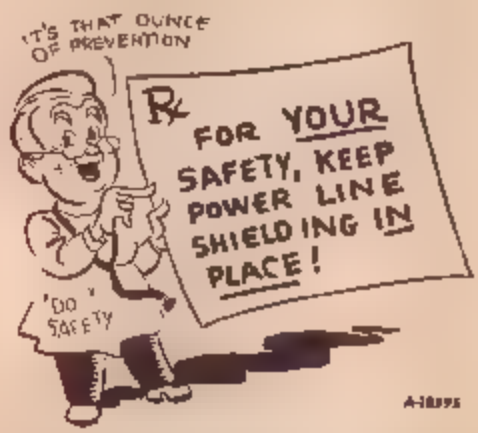
Always hitch to the tractor drawbar, and when pulling a heavy load, pul stumps, rocks, or fence posts —don't take up the slack of the chain with a jerk.



When hitching to an implement standing on sloping ground, be sure the tractor brakes are set and locked.

Continued on next page

Hitching the Implement to the Tractor — Continued



When the tractor is pulling power equipment, be sure that all power line shielding is in place and in good order

The quick-attachable drawbar can be easily removed. To remove the drawbar, loosen bolts "A" (*Illust. 16*) and unhook the complete drawbar.

Adjusting the Drawbar

The drawbar can be set at three different heights to obtain the proper hitch position.

To raise or lower the drawbar, remove bolts "B" (*Illust. 16A*), and raise or lower the drawbar to the upper or lower hole in the drawbar bracket. Replace bolts "B" and tighten securely

Illust. 16
Removing the drawbar

Illust. 16A
Drawbar adjustment.

Operating the Touch-Control System

The Touch Control system provides hydraulic power with convenient fingertip control for raising lowering and adjusting the working depth of various implements used with the tractor Implements can be regulated and adjusted without stopping work while the tractor is in motion or while standing still.

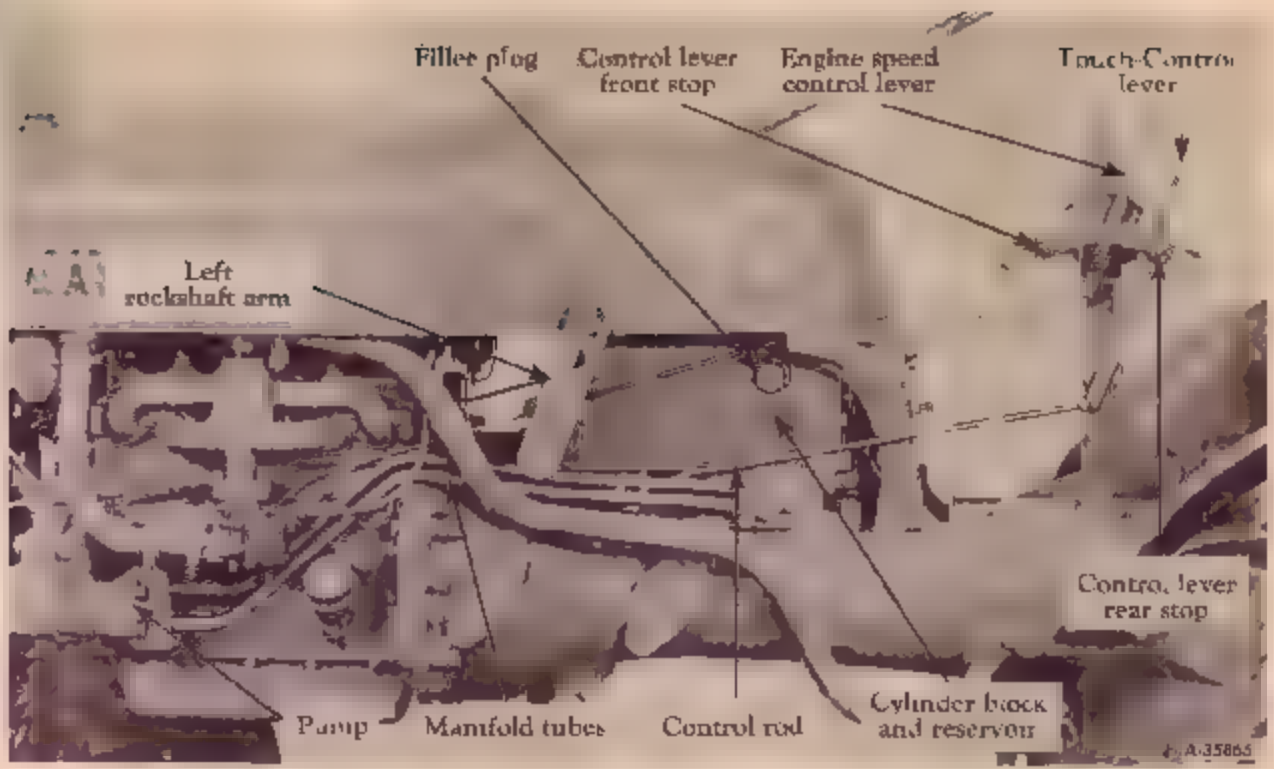
The control lever (*Illust. 17A*) gives the operator complete, instantaneous and effortless control of all the direct-connected implement operating adjustments. The use of the lever will depend on the type of implement mounted on or pulled by the tractor. Complete instructions for operating the lever are included in the Owner's or Operator's Manual furnished with the implement. General instructions for operating the lever are given below.

The control lever quadrant is provided with a pair of adjustable Touch-Control lever stops.

The front stop when set in a given position will limit the travel of the control lever and prevent the implement from being raised above the desired height.

The rear stop is used to point out the position where the control lever should be each time the implement is lowered to maintain a uniform working depth.

To lower the implement, move the control lever back until the implement has reached the desired working depth; then move the rear stop to this position and tighten in place.



Illust. 17

Showing Touch-Control assembly on International Cub Lo-Boy Tractor.

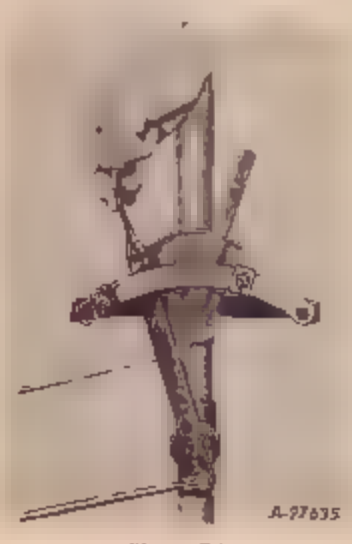
The working depth will be maintained by moving the lever back to the stop each time the implement is lowered.

After attaching the implement to the tractor, the Touch-Control lever front stop must be properly set if there is a possibility of the implement not clearing the underside of the tractor. Once the stop is set, the implement can be raised quickly by a flick forward on the control lever.

To set the Touch-Control stop, slowly move the control lever forward to raise the implement and stop it before the implement hits any part of the underside of the tractor. Then move the stop up against the control lever and tighten it in this position. This will prevent the control lever from being moved past the point of the desired lifting height.

Note: If the implement hits the underside of the tractor, in addition to doing possible damage to the tractor or implement, the Touch-Control system will not have completed its cycle and this will cause the pump unit to operate at maximum high pressure and heat the IH Touch-Control fluid excessively, thereby causing possible internal damage to the pump. This condition can be quickly detected by a noticeable loading of the engine.

If this condition should occur, immediately move the control lever back and set the control lever stop at a point where the raised implement will not hit the underside of the tractor



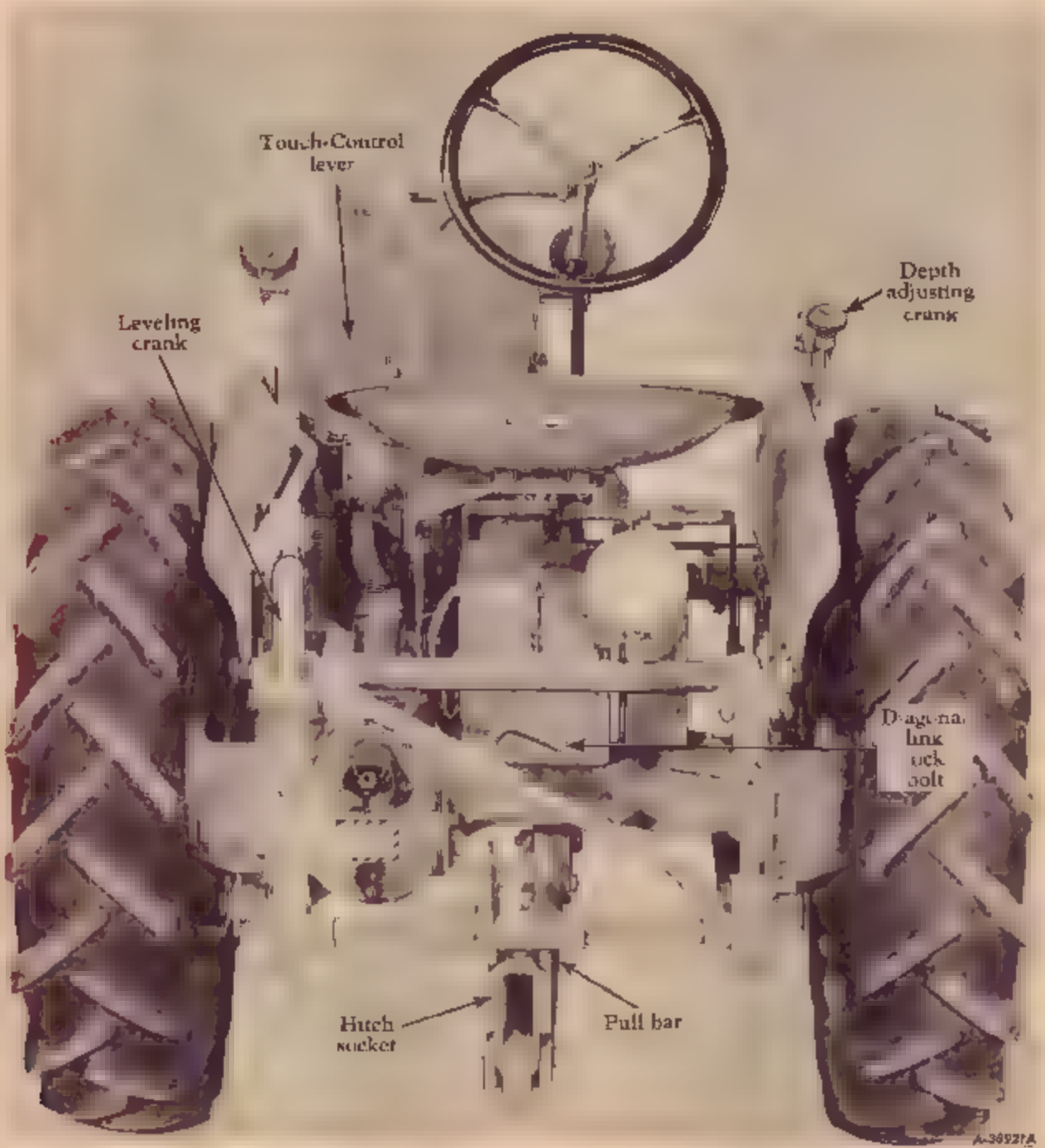
Illust. 17A

Operating the Touch-Control system

Operating the Fast-Hitch

The hitch provides an easy, simplified means of attaching and detaching rear-mounted implements and also adds to the flexibility afforded by the Touch-Control system.

Coupling, uncoupling, depth control, and leveling of implements all can be done from the tractor seat. Other adjustments, as outlined on the following pages, are available to the operator



Illust. 18
Rear view of International Cub Lo-Boy Tractor with Fast-Hitch.

Touch-Control raises and lowers the complete hitch, thus raising the implement to the transport position, or lowering it to the working position.

The leveling crank at the rear of the tractor controls leveling, and the depth adjusting crank on the right side controls depth adjustment.

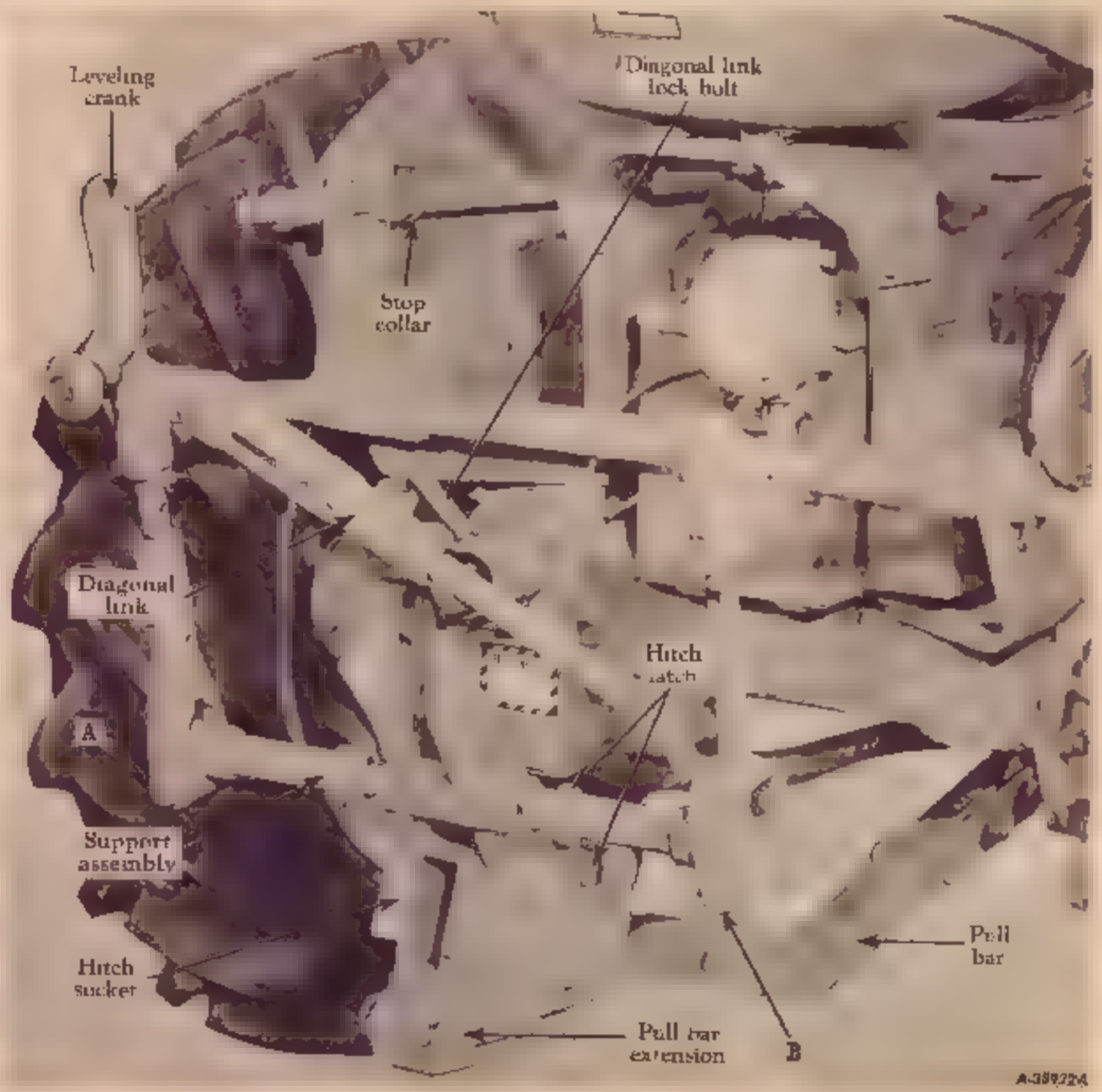
When operating the hitch in other than the low fixed drawbar position, the belt pulley unit must be removed.

Refer to "Changing from Belt Pulley to Power Take-Off" *on page 14.*

The power take-off shaft must be covered with the power take-off shaft guard.

Note: *Refer to pages 16, 17, 64, and 65* for more complete operating and maintenance instructions for the Touch-Control system

Note: The following operating and adjusting instructions are general only. Refer to the implement Operator's Manual for specific instructions



Illust. 19

Diagonal link lock bolt, pull bar extension, hitch socket, etc.

Operating the Fast-Hitch—Continued

Important! Before operating with the Fast-Hitch, the front wheels must be equipped with a set of front wheel weights and the front tire tubes must be filled three-quarters full with a calcium chloride solution as specified in the maintenance section of this manual.

The Touch-Control hand lever serves to control the raising and lowering of implements. Do not attempt to gauge the depth with this lever unless so instructed in the implement manual. Plows must be free to float up and down and to seek their own level as determined by the hitch setting. The depth adjusting crank (*Illust. 18*) serves to control the working depth of plows and various other implements. The leveling crank controls leveling as required for plowing when opening up a furrow or for a change in plowing depth. The diagonal link permits the plow to swing from side to side, when the lock bolt is loose so that the diagonal link is free to swing. The stop collar (*Illust. 19*) should be set approximately six inches away from the swivel on the lift rod to permit the plow to float up and down.

Coupling the Implements

Adjust the height of the hitch socket with the Touch-Control and level the hitch with the leveling crank so the prong of the implement can enter the hitch socket when the tractor is backed against the implement (*Illust. 19*). The latch snaps shut when the prong reaches the proper position.

To uncouple the implement on ground level, lower the implement to the ground, reach back and lift the hitch latch (*Illust. 19*) with the forefinger. If the latch is difficult to disengage, back the tractor slightly against the implement to relieve the strain on the latch. The latch will remain open until the implement prong is withdrawn.

Hitch Adjustments

The height of the hitch determines the working depth of the implement. The depth adjusting crank (*Illust. 18*) raises and lowers the front end of the pull bar until the desired working depth is reached as instructed in your implement manual.

When plowing, the lock bolt (or hand screw) on the diagonal link must be loose or unscrewed far enough so that the diagonal link is free so the plow can swing from side to side.

When operating with middlebusters or cultivators, the lock bolt must be screwed in tightly to keep the unit in a rigid position to prevent the implements from swinging.

When cultivating crops with high foliage, the Fast-Hitch pull bar may be removed if necessary.

Turn the depth adjusting crank so that the hitch ball is set at its highest position to provide more clearance under the tractor.

Fast-Hitch Load Limitations

Caution! Do not overload the rear axle or the Fast-Hitch components with the implement or accessories.

The transport loads listed below are considered satisfactory for Fast-Hitch operation. Note the front end weights required for stability. The implement weights shown in the following examples do not include any allowance for additional weights on the implement.

a. 360 pounds—five foot disk harrow (L-F3B) with ten 20-inch disks—use a rear wheel tread setting up to 56 inches.

b. 355 pounds—rotary hoe (Cub LF 11) with two sets of front wheel weights—use a rear wheel tread setting up to 56 inches.

c. Utility carrier with a 400 pound pay load in the center of the platform—use a rear wheel tread setting up to 56 inches.

In general, the loads must decrease as the tread settings increase, and the loads must decrease as the distance from the rear axle to the center of gravity of the load increases.

LUBRICATION

The life of any tractor depends upon the care it is given. Proper lubrication is a very important part of that care.

General Engine Lubrication

The engine has a pressure-feed lubrication system. A gear-type oil pump circulates the lubricating oil under pressure to the crankshaft bearings, connecting-rod bearings, camshaft bearings, valve mechanism, timing gears, and governor, thereby assuring positive lubrication of all parts.

Oil Pump

The gear-type oil pump in the crankcase has a screen attached to the oil intake which stops large dirt particles from entering the oiling system. Clean this screen whenever the oil pan is removed.

Oil Pressure Gauge

This gauge indicates whether lubricating oil is circulating through the engine. Under all operating conditions, the engine oil pressure should hold the indicator needle past the first mark above zero when the engine is running at speeds approximately 100 r.p.m. above slow idle speed. *See Illust. 5B.* If the needle does not move past the first mark above zero, stop the engine immediately and investigate the cause of the oil pressure failure. If you are unable to find the cause, be sure to consult your International Harvester dealer before operating the engine.

Always look at the oil pressure gauge immediately after starting the engine.

Crankcase Breather

The crankcase breather and oil filler cap (*Illust. 21*) has an oiled aluminum crimp filler which acts as a dust filter for crankcase ventilation. Clean and recoil this breather each time the engine oil is changed.

Illust. 21

Checking the oil level in the crankcase.

Do not run the engine for any length of time with the oil level below the low mark on gauge. *See Illust. 21*

Never check the oil level while the engine is operating.

Oil Filter

The engine is equipped with an oil filter which continually cleans the oil while the engine is running.

The life of your engine depends upon clean oil being circulated to all bearings. Every good tractor operator knows that dirt and other injurious materials eventually get into the crankcase of the engine, and that in the normal course of engine operation, the lubricating oil undergoes changes which produce sludge, acids, gums, varnish, and other harmful by-products.

The purpose of the oil filter is to separate and remove the dirt and other foreign substances from the oil to prevent these injurious materials from being circulated to the engine.

This filter is so efficient it will keep the circulating oil free of harmful materials for 150 hours of operation under normal operating conditions. Cleaning the old element is not satisfactory. *Refer to "Lubrication Guide"* for the recommended oil to use for the prevailing temperature. By following the simple, common-sense procedure for keeping dirt and oil impurities away from precision-made engine parts, you will safeguard your tractor engine against undue wear and the operating troubles and upkeep expense which are a natural result of that condition.

Changing the Filter Element

1. Do not change the element while the engine is running.

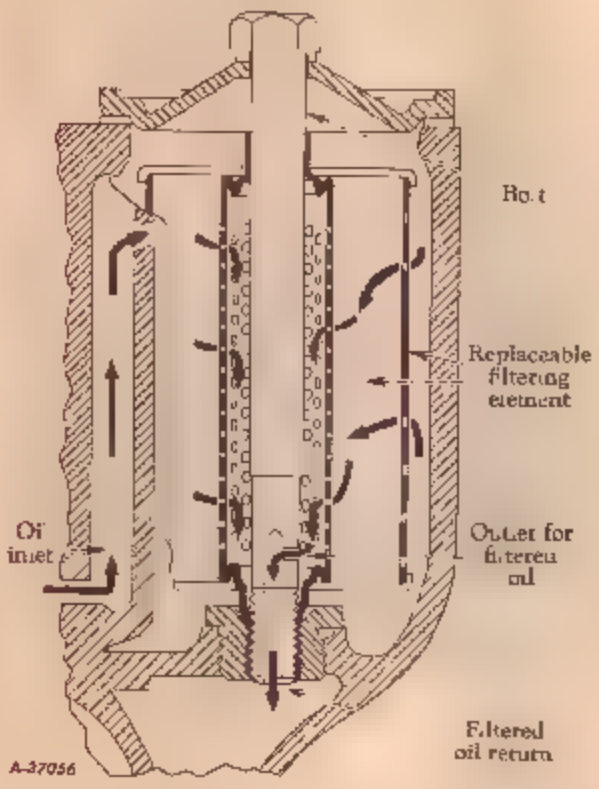
2. Remove the oil filter drain pipe cap (*Illust. 22A*) and allow the oil filter to drain completely.

3. Clean off filter cover "A" (*Illust. 22B*) to prevent dirt from dropping into the filter when the cover is removed.

4. Unscrew and remove bolt "B" and gasket "C" (*Illust. 22B*).

Continued on next page

Changing the Filter Element—Continued



Illust. 22

Diagram of oil flow through the filter

5. Lift up and remove filter cover "A" and gasket "D" (*Illust. 22B*).

6. Remove the old element.

7. If the oil appears very dirty or sludgy when draining, flush out the filter case with kerosene. Before flushing, however, replace the bolt without the filter cover in order to prevent sludge from being flushed into the crankcase. When completely flushed and drained, replace the drain pipe cap.

8. Inspect the small metering hole at the threaded end of the oil filter retainer bolt, and make sure it is not plugged. A plugged metering hole will impair or stop all oil flow through the oil filter element.

9. To install the new filter element, move gasket "C" up to the top of bolt "B" and place cover "A," gasket "D" and the new element on the bolt in their proper order. *See Illust. 22B.* Then install the entire assembly and be sure that filter cover gasket "D" seats properly. Screw the bolt into the filter base and tighten securely.

10. Check the oil level in the crankcase to see that the new oil is up to the proper level (*see "Lubrication Guide"*). Now start up the engine, check the oil pressure indicator to see whether lubricating oil is circulating through the engine, and inspect the filter for oil leaks.

Illust. 22A

Installing the new oil filter element

Note: To avoid delays, we recommend that you carry extra elements on hand so replacement can be made at the proper time.

Illust. 22B

Oil filter assembled.

Greasing the Front Wheels

Removing and Greasing

After every six months or every 500 hours of operation, whichever occurs first, remove, clean and grease the front wheel bearings.

To grease the front wheels, raise the front end of the tractor until the wheel clears the ground and remove the wheel *as shown in Illust. 23.* Unscrew hub cap "A" (*Illust. 23A*), remove the cotter pin, and remove nut "B" and washer "C." Remove bearing "D" and place it in hub cap "A" or a clean container; then remove and clean the inside of hub "E."

Illust. 23

Front wheel removed from hub.

Remove the old grease from the bearings and clean them thoroughly with kerosene. Then pack the bearings with fiber grease.

Illust. 23A

Front wheel hub and bearing removed for cleaning

It is advisable to leave bearing "F" on the axle and clean it with a brush and kerosene. Apply new grease on rollers before reassembling the bearings.

Inspect oil seal "G" and felt washer "H," and if they are not in satisfactory condition, replace them with new ones.

Replacing and Adjusting

Reassemble the hub and wheel, tighten nut "B" until the wheel binds slightly, rotating wheel at the same time. Back the nut off one castellation from the cotter pin hole; replace cotter pin and hub cap.

Be sure to keep all parts clean.

Lubricating Oil and Grease Specifications

Engine Oil

Engine lubricating oil of regular, premium or heavy-duty grade is satisfactory for use in this engine. The oil should be well-refined petroleum oil, free from water, fatty oils and acids.

To Aid Starting

To aid easier starting, the selection of crankcase lubricating oils should be based on the lowest anticipated temperature for the day. It is not necessary to change the crankcase oil every time the temperature rises or falls into another temperature range during some part of the 24-hour day.

Also refer to "Cold Weather Precautions" on pages 32 and 33

Don't oil or grease the tractor while the engine is running.

LUBRICATION

Gear Lubricant

Tractors are shipped from the factory with lubricant in the transmission, steering gear, rear axle and belt pulley housings

Use high-quality oil, free from solid materials Use only high-quality lubricating oils and grease

For your own protection, select only oils and grease of recognized manufacture.

Keep your supply of lubricating oil absolutely clean and free from dust Always use clean containers. Keep the lubricator clean and wipe dirt from the lubrication fittings before applying the lubricator

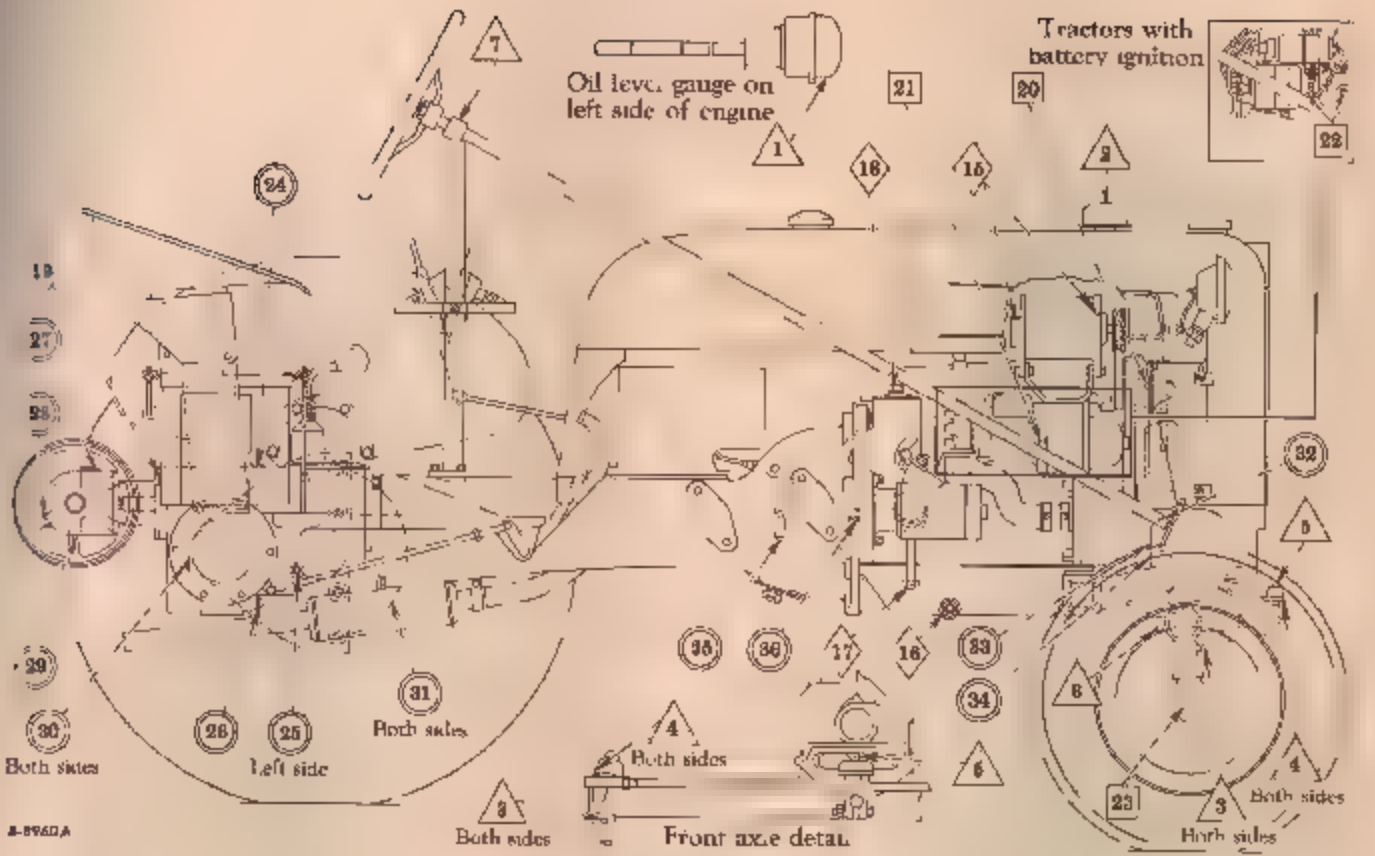
Lubrication Table

Point of Lubrication	Capacity	Above +80° F	Above +32° F to +80° F	Below +32° F
Engine crankcase	3 qt.	SAE-30	SAE-20	SAE-10W
Air cleaner Donaldson type United type	 ½ pt ⅝ pt.	SAE-30	SAE-20	SAE-10W

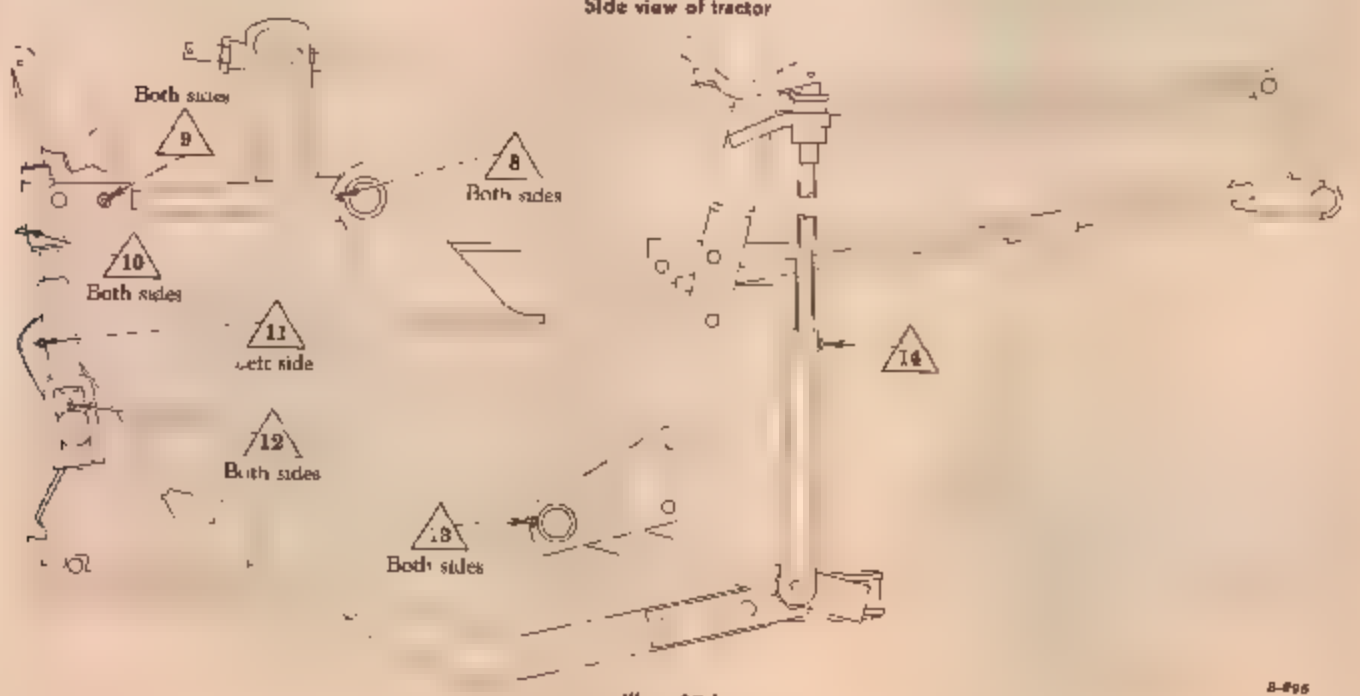
Point of Lubrication	Capacity	Anticipated Air Temperature		
		Above +32° F.	+32° F. to +10°	Below +10° F
Magneto Rotor bearing Impulse coupling		SAE-30 *	SAE-20 *	SAE-10W *
Battery ignition unit (tractors so equipped) Distributor and drive housing Cam hole felt (in distributor)		Chassis lubricant Light engine oil	Chassis lubricant Light engine oil	Chassis lubricant Light engine oil
Generator		SAE-20	SAE-20	SAE-20
Cranking motor		None	None	None
Transmission	3½ pt.	SAE-80	SAE-80	SAE-80
Rear axle housing	1 to 2 qt. ea	SAE-80	SAE-80	SAE-80
Steering gear	¾ pt.	Full strength IH Torque Amplifier Transmission Lubricant Additive		
Belt pulley housing	⅓ pt.	SAE-80	SAE-80	SAE-80
Touch Control reservoir (refill)	1½ pt.	IH Touch-Control Fluid	IH Touch-Control Fluid	IH Touch-Control Fluid
Lubrication fittings†		Chassis lubricant	Chassis lubricant	Chassis lubricant

*Impulse coupling: Use a very light oil, such as cream separator or sewing machine oil, for all temperatures above +32°F Use kerosene for temperatures below +32 F *Refer to page 40* for further information.

†Use pressure-gun grease (chassis lubricant) for fittings on which the hand lubricator is applied, for all temperatures.



Illust. 25
Side view of tractor



Illust. 25A
Side view of Fast-Hitch

LUBRICATION

Key to Lubrication Guide

The symbols shown around the reference numbers *in Illusts. 25 and 25A* indicate the intervals of lubrication.

Paragraph numbers on the left side of the lubrication guide correspond with reference numbers *in Illusts. 25 and 25A.*

Detail specifications of the lubricants are listed *on page 24.*

△ Daily or After Every 10 Hours of Operation

Illust. 26
Crankcase oil filler.

1—Crankcase oil level gauge and filler cap.

Check the oil level (with the engine stopped) and add sufficient new oil to bring to the "FULL" mark on the bayonet gauge. *See Illust. 27.* If the oil level is checked after the engine has been stopped for some time, the oil level may show slightly above the "FULL" mark on the gauge. This is a normal condition as the result of oil draining back from the filter. *See Illust. 26.*

2—Air cleaner.

Clean out the oil cup and refill the cup to the oil level bead with the same new oil as used in the engine crankcase. *See Illust. 37A.* Capacity: Donaldson type—½ pt. (*See Illust. 26A*), United type—⅜ pt.

Illust. 26A
Air cleaner oil cup.

3—Steering knuckle post (2).
4—Tie rod (2).
5—Tie rod ball seat.
6—Front axle pivot shaft.
7—Steering shaft support bracket.

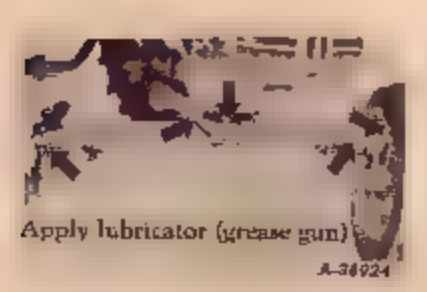
Use pressure gun grease (chassis lubricant) and apply 2 or 3 strokes of the lubricator or sufficient grease to flush out old grease and dirt. Lubrication points are the same for both fixed and adjustable front axles. *See Illust. 26B.*

Use an oil can and put a few drops of engine oil in the oil hole. *See Illust. 26C.*

Fast-Hitch

8—Rockshaft plate bearing (2)
9—Rockshaft arm swivel (2)
10—Lateral link swivel, upper (2)
11—Leveling screw housing (1)
12—Lateral link swivel, lower (2)
13—Ball bearing (2)
14—Depth adjusting screw housing (1)

Use pressure-gun grease (chassis lubricant) and apply 2 or 3 strokes of the lubricator or sufficient grease to flush out old grease and dirt. *See Illust. 25A and 27.*



Illust. 26B
Front axle.

Illust. 26C
Steering shaft support bracket

Illust. 27
Fast-Hitch.

○—Weekly or After Every 60 Hours of Operation

Miscellaneous parts. Lubricate the clutch and brake pedal connections with a few drops of engine oil.

◇—After Every 150 Hours of Operation

15—Generator oil cups (2). Insert the oil can spout through the holes in the hood above each oil cup. Lift up the cap on each oil cup and apply 8 to 10 drops of SAE 20 oil in each cup. *See Illust. 27A.*

16—Crankcase oil pan Drain while the oil is warm. Remove drain plug (16) and drain all oil from the crankcase pan. *See Illust. 27B.* Replace the drain plug. Remove crankcase filler cap (1). Refil. the crankcase pan with new oil up to the "FULL" mark on the bayonet gauge. *See Illust. 21.* Capacity 3 quarts.

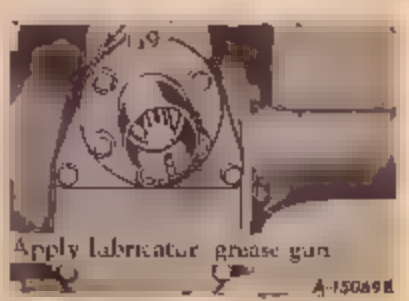
Illust. 27A
Generator.

17—Oil filter drain.
18—Oil filter element. Replace the oil filter element every time the crankcase oil is changed. *See Illust. 27C.* Remove pipe cap (17) and allow all oil to drain out. Remove oil filter bolt (18) and the filter cover, and remove the used filter element. If the oil appears very dirty or sludgy when draining, flush out the filter with kerosene. Before flushing, however, replace bolt (18) without the filter cover in order to prevent sludge from being flushed into the crankcase. Replace drain cap (17) and install the new filter element as instructed *on page 22.*

19—Power take-off shaft. Use pressure-gun grease (chassis lubricant) and apply two or three strokes of the lubricator. *See Illust. 27D.*

Illust. 27B
Crankcase drain plug.

Illust. 27C
Oil filter



Illust. 27D
Power take-off

LUBRICATION

Illust. 28
Fan hub.

□—Every Six Months or After Every 500 Hours of Operation

20—Fan hub.

Turn the fan hub so oil retainer screw (20) is to the right-hand horizontal position. Remove the screw and fill the hub to the level of the filler hole opening with engine oil. Now turn the fan hub so the oil filler hole is on the bottom to allow excess oil to drain off. Replace the oil retainer screw. *See page* 36 for more information. *See Illust. 28.*

21—Magneto.

Fill rotor bearing oil cup (21) once with the same oil used in the engine crankcase. *See Illust. 28A. See page* 39 for more information.

Illust. 28A
Magneto.

22—Distributor (battery ignition unit).

Remove the grease plugs and insert lubrication fittings. Apply pressure-gun grease (chassis lubricant) to the distributor fitting until a small quantity comes out of the relief hole opposite the plug. Apply several strokes of the lubricator to the drive housing fitting. *See Illust. 28B.*

Remove the distributor cap and distributor rotor, and apply one or two drops of light engine oil to the felt in the hole at the end of the breaker cam. *See pages 42 and 43* for complete information.

23—Front wheels

Remove, clean and repack the front wheel bearings with fiber grease. *See page* 23 for more information.

Illust. 28B
Distributor.

◎—Periodic

Check the oil level periodically. Use approved lubricant (*page 24*) and keep the lubricant up to level plug (25) on the left side of the transmission case. *See Illust. 28C.* Change the oil in the transmission case at least once a year. However, do not drive the tractor more than 1,000 hours without changing the oil. Remove drain plug (26) and allow all oil to drain out. *See Illust. 28D.* Replace the drain plug and remove filler plug (24) and level plug (25). Refill with approved lubricant up to the level plug opening and replace the plugs. *See Illusts. 28C and 28E.* The capacity is 3½ U. S. pints.

Transmission

24—Oil filler plug

25—Oil level plug

26—Oil drain plug

Illust. 28C
Transmission oil level plug.

Illust. 28D
Transmission oil drain plug.

Illust. 28E
Transmission filler plug

Illust. 29

Belt pulley.

Belt Pulley Housing

27—Filler plug.

28—Level plug

29—Drain plug.

Check the oil level periodically. Use approved lubricant (*page 24*) and keep the lubricant up to level plug (28). Drain and refill the housing each time the oil is changed in the transmission case. To change the oil, remove drain plug (29) and allow all oil to drain out. Then replace the drain plug. Remove filler plug (27) and level plug (28). Fill up to the oil level plug opening and replace the plugs. *See Illust. 39.* The capacity is ½ U. S. pint.

Illust. 29A

Rear axle housing

Rear Axle Housing

30—Oil filler and level plug (2).

31—Oil pan (2).

Check the oil level periodically. Use approved lubricant (*page 24*) and keep the lubricant up to level plug (30) in each rear axle housing. *See Illust. 29A.* Change the oil at least once a year. However, do not drive the tractor more than 2,000 hours without changing the oil. To drain, remove rear axle housing pan (31). Clean the pan and replace it. Remove plug (30) and fill up this level with approved lubricant. Replace the plug. The capacity is 1½ U. S. quarts for each housing.

Illust. 29B

Steering gear housing.

Steering Gear Housing

32—Filler plug.

33—Level plug

34—Drain plug.

Check periodically and add sufficient approved lubricant (*page 24*) to the level of plug (33). Change the oil at least once every year. However, do not drive the tractor more than 1,000 hours without changing the oil. Drain by removing drain plug (34) and refill with new lubricant. To fill, remove filler plug (32) and level plug (33) and fill with approved lubricant to the level plug opening. Replace the plugs. *See Illust. 29B.* Capacity ¾ pint.

Illust. 29C

Clutch release bearing.

35—Clutch release bearing.

Use pressure-gun grease (chassis lubricant). After every 1,000 hours or at least once every year, apply a few strokes of the lubricator to clutch release bearing fitting (35) or just enough grease until it starts to come out of the bleeder hole on top of the bearing retainer. To reach the fitting, remove the clutch housing handhole cover. *See Illust. 29C. Also see Illust. 57A.*

36—Clutch pilot bearing.

Does not require lubrication (oil-less bushing).

Touch-Control Reservoir

Filler and level plug.

Drain plug.

Refer to pages 64 and 65.

Miscellaneous Parts

Occasionally put a few drops of engine oil on the engine control linkage, such as the engine speed control rod, governor connections, etc.

MAINTENANCE

Periodic Inspections

A-21539

To keep your tractor performing efficiently it is advisable to systematica ly inspect the following points at intervals as outlined below.

After Every 10 Hours of Operation

Air cleaner cap	Remove any dirt or chaff * *See page 37.*
Air cleaner oil cup	Remove, clean and refill.* *See page 37*
Lubrication points	*See "Lubrication Guide."*
Cooling system	Check the level of the coolant in the radiator. *See page 34.*

After the First 50 Hours of Operation

Engine valves (with valve rotators)	Check for clearance. *See page 56.*

After Every 60 Hours of Operation

Air cleaner, complete	Remove and clean.* *See page 37*
Flexible rubber connection between air cleaner and carburetor	Inspect for loose fit or damage.
Fan belt and generator belt	Check tension; replace when necessary. *See pages 36 and 48.*
Radiator fins	Clean spaces. *See page 36.*
Lubrication points	*See "Lubrication Guide"*

After Every 150 Hours of Operation

Lubricating oil filter	Replace the filter element. *See page 22.*
Engine crankcase	Drain and change the oil.
Lubrication points	*See "Lubrication Guide"*
Crankcase breather cap	Clean in kerosene.
Storage battery	Check the liquid level and specific gravity (*pages 54 to 56*).
Engine valves (with valve rotators)	Check for clearance. *See page 56.*

After Every 250 Hours of Operation

Fuel strainer and sediment bowl	Take apart and clean. *See page 32.*
Spark plugs	Remove and clean, check gaps. *See page 38*
Magneto breaker points and chamber (tractors with magneto)	Clean chamber and check opening. *See pages 39 and 40.*
Magneto drive chamber and impulse coupling (tractors with magneto)	Check and clean if necessary. *See page 40.*

After Every 400 Hours of Operation

Engine valves	Check for clearance. *See page 56.*
Clutch pedal	Check for free movement. *See page 57.*
Brakes	Check for free movement and equalization. *See page 58.*

Every 6 Months or After Every 500 Hours of Operation

Cooling system	Clean. *See page 35*
Front wheels	Clean and repack with new grease. *See page 23.*
Lubrication points (500 hours and 1,000 hours)	*See "Lubrication Guide" (Periodic).*
Distributor breaker points and chamber	Clean chamber and check points and opening. *See pages 42 and 43*

*When unusual dust or dirt conditions are encountered during operation, it may be necessary to service more frequently

Carburetor

The presence of dirt and water in the fuel will disturb the functioning of the carburetor. Use a good grade of clean gasoline.

The fuel strainer (located under the gasoline tank) collects practically all the dirt and sediment which may enter the gas tank. Clean the fuel strainer after every 250 hours of operation.

A small strainer screen is provided in the carburetor at the fuel-line connection. This screen prevents dirt or metal chips which may have collected in the fuel line during field installation from entering the carburetor. The screen can be cleaned if necessary, when the carburetor is removed, by removing the fuel bowl cover and float valve cage assembly and forcing air through the screen in the opposite direction from the fuel flow.

Periodically check for tightness flange nuts "A" (*Illust. 31*) which hold the carburetor to the manifold.

Occasionally check cover screws "B" (*Illust. 31*) which fasten the fuel bowl to the fuel bowl cover. They must be kept tight to avoid any air leakage past the fuel bowl cover gasket.

The engine and carburetor are correctly set when shipped from the factory. If for any reason this setting has been disturbed, the following procedure should be followed.

Adjusting the Idle Adjusting Screw

Close the idle adjusting screw to its seat by turning to the right (or in); then open one full turn. Start the engine and operate it at the fast idling speed (without any load) until thoroughly warm. (Cover the radiator if necessary.)

Illust. 31

Carburetor adjustment.

Illust. 31A

Removal of carburetor.

Close the throttle by pulling the engine speed control lever all the way back. If the engine misses or rolls, slowly turn the idle adjusting screw in or out until the engine operates smoothly. Speed up the engine for a few seconds; then recheck the idle.

Removing the Carburetor

1. Close the shut-off valve on the fuel strainer.

2. Drain the carburetor by removing the drain plug.

3. Disconnect the choke and governor controls.

4. Disconnect the fuel line.

5. Remove the air cleaner connections to the carburetor.

6. Remove the two nuts and lock washers holding the carburetor to the manifold, and lift off the complete carburetor. *See Illust. 31A.*

Installing the Carburetor

1. Install the carburetor on the engine in the reverse order of removal.

2. Always install a new gasket between the carburetor and manifold if the old one is damaged.

3. Be sure the carburetor drain plug is screwed in tight, then turn on the gasoline supply.

4. Adjust the carburetor as described previously.

Fuel Strainer

Cleaning the Fuel Strainer and Sediment Bowl

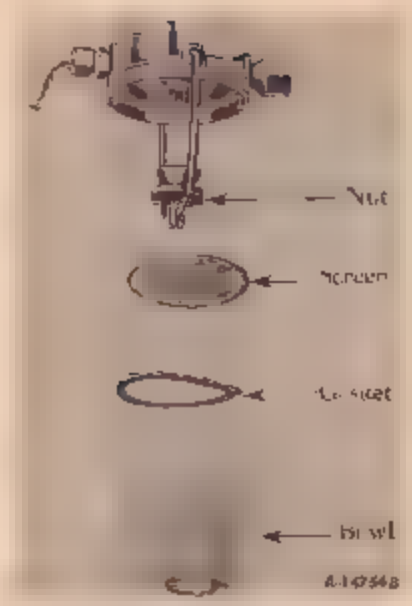
The fuel strainer should be cleaned after every 250 hours of operation; to do this, proceed as follows.

1. Close the shut-off valve.

2. Take the strainer apart by loosening the lower jam nut.

3 Clean out the sediment bowl and clean the screen if necessary

4. When reassembling, be sure that the cork gasket between the bowl and main body is in good condition and does not leak. Use a new gasket if necessary



Illust. 32
Fuel strainer showing glass bowl removed for cleaning

Cold Weather Precautions

When operating the tractor in temperatures of +32° F. or lower, observe the following precautions.

Fuel System

Use only a high-test, winter-grade gasoline, and keep your supply in a closed container so the more volatile portion does not evaporate

Fill the fuel tank at the end of the day's run to prevent moisture from collecting in the tank.

Lubrication

Be sure to use lubricant of the correct viscosity in the engine crankcase, air cleaner, magneto impulse coupling, rear axle housings, transmission, steering gear case and belt pulley housing *as specified on page 24.*

Magneto Impulse Coupling (Tractors with Magneto)

For satisfactory starting, it is important to keep the magneto impulse coupling oiled liberally *as specified on page 40.* The impulse coupling should be kept free of dirt and gummy rust formation.

When the engine is hand-cranked, the impulse coupling should trip (click) twice for each revolution of the engine Failure to do so may indicate the need for cleaning. *Refer to page 40* for further information.

Cooling System

When the temperature is likely to be +32° F. or lower, there is danger of the water freezing in the cooling system. To prevent this, either drain the water from the cooling system at the end of each run, or use one of the recommended antifreeze solutions

Draining the System

1. Remove the radiator drain plug on the bottom (left side) of the radiator. *See Illust. 34A.*

2. See that the drain is not plugged and that the water drains completely

Important Before filling the radiator in freezing weather, cover the entire radiator and start the engine; then put in water immediately. This prevents water from freezing during the warming-up period. When the engine has warmed up, uncover the radiator

1. If an antifreeze is to be used, observe the following instructions.

2. Drain and clean out the cooling system as described *on page 35.*

3. Inspect the hose connections. They must be in good condition inside and out. Then tighten all water connections.

4. Inspect the fan belt and adjust it to the proper tension as described *on page 36.* If the belt is worn or oil soaked, it is best to install a new one.

5 Before refilling the cooling system, make sure that the radiator drain is tightly closed Then put the required amount of antifreeze into the cooling system. Fill up the radiator with clean water (use soft or rain water if possible) to a level slightly below the bottom of the filler neck.

The following table shows the amount of antifreeze to use for various temperatures.

Caution! Use only one type of antifreeze. Do not use a mixture of solutions, as it will be difficult to determine how much protection you have against freezing.

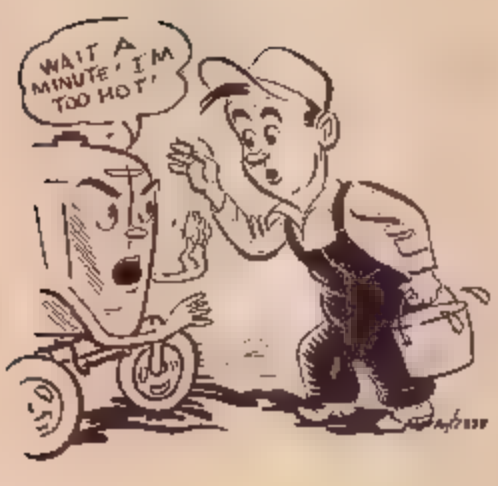
Never use any of the following in the cooling system as an antifreeze:

Honey, salt, kerosene, diesel fuel, glucose, sugar, calcium chloride or any alkaline solution.

Do not use alcohol as an antifreeze if other materials are available, as denatured alcohol boils at +173° F. However, if it is necessary to use alcohol, check the solution frequently to see that you have adequate protection against freezing.

Freezing Point (Fahrenheit)	Pints of antifreeze required: Ethylene Glycol	Distilled Glycerine	Denatured Alcohol
+10°	5	6½	6
0°	6½	8	7½
−10°	8	9½	8½
−20°	9	10½	10
−30°	10	11½	11½
−40°	10½	—	13
−50°	11½	—	14
−60°	12	—	15½
−70°	13	—	—

Cooling System



When the tractor is shipped from the factory it is equipped with a nonpressure-type radiator cap.

A pressure-type radiator cap is available from your International Harvester dealer as a replacement for the regular production radiator cap, if so desired.

Caution must be exercised in removing the pressure-type radiator cap when the water in the cooling system is hot. See instructions in the following section.

When the radiator is equipped with a nonpressure-type radiator cap, the water is circulated through the engine block, cylinder head, and radiator by the thermosiphon method. As the engine warms up, the water is heated, expands, and circulates back through the radiator where the water is cooled before again circulating through the engine.

When the radiator is equipped with a pressure-type radiator cap, the cooling system operates under pressure which is controlled by means of a regulating valve built into the radiator cap. Always use clean water (soft or rain water if possible).

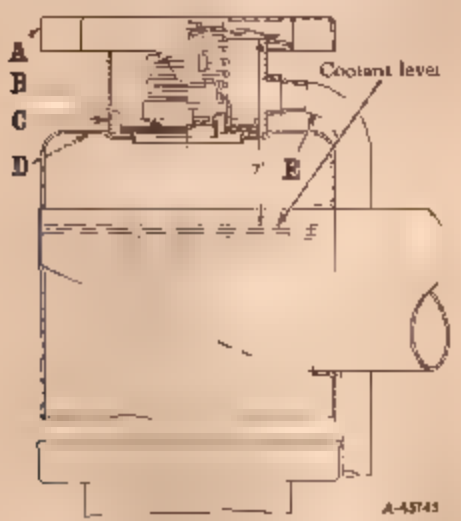
Adding Water to the Cooling System (When Equipped with Pressure-Type Radiator Cap)

Caution! If the water in the cooling system is hot and water is to be added, observe the following:

Turn radiator cap "A" (*Illust. 34*) slowly counterclockwise to the safety stop to allow the pressure or any steam to escape; then press down on the cap and continue to turn until the cap is free to be removed.

Allow the engine to cool and fill the radiator slowly to approximately 2 inches below the top of filler neck "C". Due to expansion, when the system becomes hot, any excess water will be discharged through overflow pipe "E."

Note: Do not pour cold water into the radiator if the engine is very hot, unless conditions make it absolutely necessary, in which case start the engine, let it idle, and slowly pour water into the radiator.



"A" Radiator cap.
"B" Filler cap gasket
"C" Filler neck
"D" Upper water tank
"E" Overflow pipe

Illust. 34

Water level in pressure-cooled radiator

The cooling system capacity is approximately 9¾ U.S. quarts. Be sure the radiator drain (*Illust. 34A*) is closed, then fill the radiator to a level slightly below the bottom of the filler neck when equipped with a nonpressure-type radiator cap; or to a level approximately 2 inches below the top of the filler neck when equipped with a pressure-type radiator cap. Filling the radiator to this level will allow for expansion of the coolant under normal operating conditions. Use clean water; soft or rain water is recommended, as it does not contain alkali, which forms scale and eventually clogs passages.

Illust. 34A

Water cooling system

Before replacing the filler cap, be sure to remove any chaff or dirt particles which may be on the gasket surface or cap, and tighten the cap clockwise to the stop.

Note: A pressure-cooled system will not operate properly unless the cooling system is tight.

The gasket surface must be in good condition. The cap must be properly tightened to the stop, and the system must not have loose connections or leaks. Unless these instructions are followed, pressure will not be maintained, and loss of water and consequent overheating will result. When draining the radiator, always remove the filler cap to permit complete drainage.

Do not attempt to repair or replace any of the regulating valve parts. If the valve is faulty, replace it with a new radiator cap of the same type.

If the engine is to be operated in freezing temperatures, refer to "Cold Weather Precautions."

Cleaning the Cooling System

Twice a year or more often depending upon the kind of cooling water used, the cooling system should be drained and thoroughly flushed out. This is particularly important before using an antifreeze solution.

Drain the cooling system by removing the plug on the bottom (left side) of the radiator (*Illust. 34A*). Allow the system to drain; then replace the plug.

Unless the cooling water is treated with a corrosion preventive, rust and scale will eventually clog up passages in the radiator and water jackets. This condition is aggravated in some localities by the formation of insoluble salts from the water used.

Cleaning solutions are available which have proven very successful in removing the accumulation of rust, scale, sludge and grease. This solution should be used according to the manufacturer's recommendation.

Note: Do not use chemical mixtures to stop radiator leaks except in an emergency. Never use such solutions instead of needed radiator repair.

Illust. 35

Rust and corrosion accumulation.

If the radiator is clogged with insoluble salt formations, it should be taken to a reputable concern specializing in the removal of such formations. Reliable radiator service stations are familiar with local conditions and are equipped to apply the proper treatment.

The condition of extreme rust clogging illustrated, is convincing proof that the practice of flushing the system by forcing water from a hose in the radiator filler neck, without the use of cleaning solutions, may be only a waste of time. Iron corrosion is greater than that of any other cooling system metal, which accounts for the large quantities of rust found in neglected water jackets. Heavy rust deposits in the water jacket hold in heat and create local hot spots, especially around the exhaust valve seats. Under these conditions, the metal may get so hot that the valves will stick or burn, or the cylinder block or head may be damaged by heat cracking.

Rust Prevention

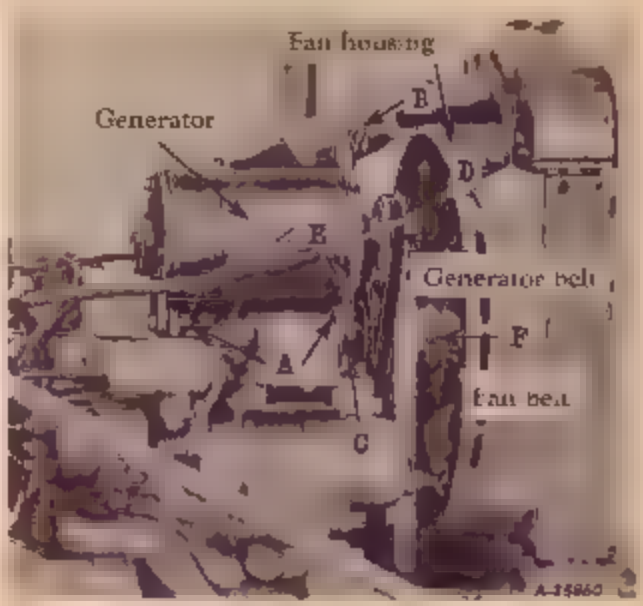
One of the most common causes of engine overheating is a rust-clogged cooling system. Rust interferes with circulation and cooling, which causes overheating.

In localities where alkaline, acid, or saline waters are the only kind available, the addition of a rust preventive or "inhibitor" will tend to minimize the corrosive action of such water.

For rust prevention during winter use of the engine, a fresh filling of antifreeze containing an effective corrosion preventive should be used. In the spring, drain and discard the old antifreeze solution, as the rust preventive or "inhibitor" may be exhausted from contamination and continued use.

After draining the antifreeze, a rust preventive should be added to the cooling water to protect the cooling system during warm weather operation. This inhibitor solution should be drained and discarded in the fall when danger of freezing again makes necessary the use of an antifreeze.

Radiator Core



Illust. 35A

Fan and generator belts.

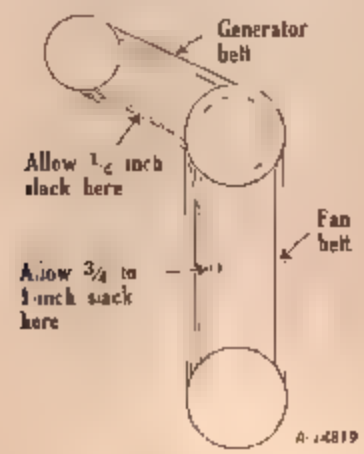
Continued on next page.

Radiator Core—Continued

Overheating is often caused by bent or clogged radiator fins. If the spaces between the radiator fins become clogged, clean them with forced air or water. When straightening bent fins, be careful not to injure the tubes or break the bond between the fins and tubes.

Fan Belt Tension

Check the slack of the fan belt after every 60 hours of operation to assure maintenance of the correct tension. The tension is correct when the belt can be depressed without effort by the thumb, approximately ¾ inch to 1 inch, midway between the two pulleys. *See Illust. 36.* If the slack is more than 1 inch, adjust the belt as follows:



Illust. 36

Correct belt tension

Adjusting the Fan Belt

When the tractor is equipped with a generator, first loosen nuts "A" and "B" before adjusting the fan belt tension. The tension of the fan belt is adjusted by loosening fan spindle "C" (*Illust. 35A*) and moving the fan and hub assembly up or down until the correct tension is obtained. After the correct tension is obtained, tighten fan spindle "C." To adjust the generator belt, *see "Generator Belt."*

After a new belt has been in use approximately 60 hours, check the tension and adjust again if necessary.

Removing the Fan Belt

To remove the fan belt, loosen fan spindle "C" (*Illust. 35A*) and slide the fan and hub assembly to the bottom of the groove on the crankcase front cover. The fan belt can then be slipped over the bottom drive pulley and worked up over the fan blades.

Replacing the Fan Belt

Replace the fan belt when it becomes soaked with grease, or when it is so badly worn that it does not drive the fan at the proper speed.

When replacing the belt, reverse the procedure outlined under *"Removing Fan Belt,"* except that belt can be started on the lower pulley by hand, and by slowly cranking the engine, the belt will find the correct position.

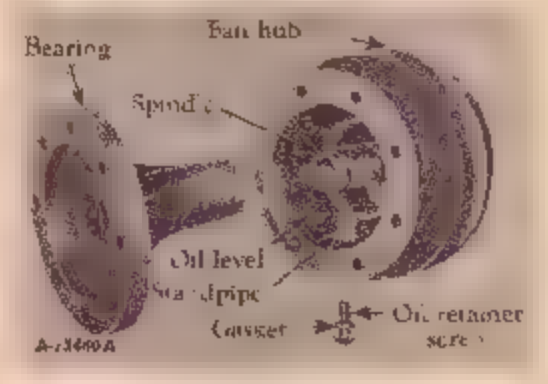
Generator Belt

After the fan belt tension has been adjusted, move the generator toward or away from the engine to get the correct generator belt tension; then tighten nuts "A" and "B." *See Illust. 35A.* The generator belt should be tight enough as not to allow slippage, but not so tight as to cause side thrust on the generator bearing. Allow ¼ inch slack. *See Illust. 36.*

Fan Hub Lubrication

Every six months or after every 500 hours of operation, whichever occurs first, remove oil retainer screw "F" (*Illust. 35A*) and turn the fan assembly so that the oil filler hole is at the right horizontal position. Add engine oil until the oil reaches the level of the hole. Now turn the assembly so that the hole is on the bottom and allow any excess oil to drain out. The oil is then up to level of the top of the stand pipe (approximately 1½ ounces). *See Illust. 36A.* Replace the oil retainer screw and be sure that the retainer screw gasket is in place.

Note: The rubber gasket located behind the hub at "E" (*Illust. 35A*) is used for shipping purposes only. It does not have to be replaced when worn out.



Illust. 36A

Fan hub partially disassembled showing oil level

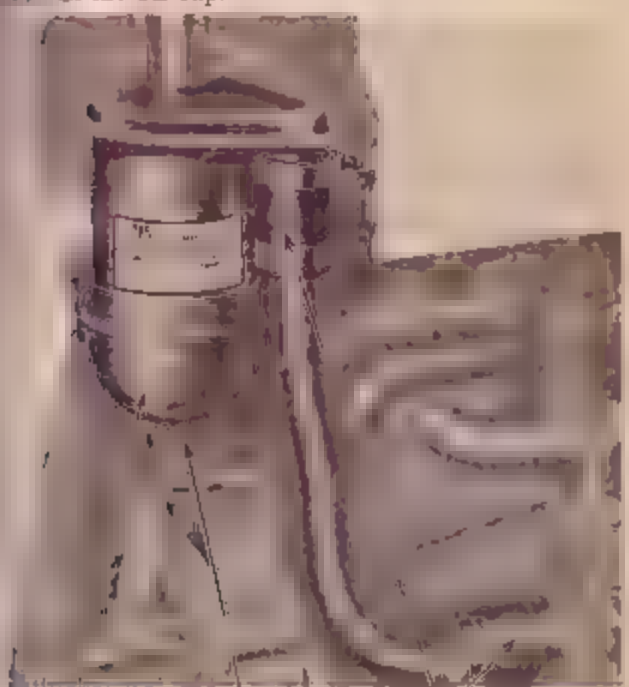
Air Cleaning System

[illegible] air for combustion is assured by an oil-type [illegible]er. A heavy screen in the air intake cap [illegible] large particles from entering the air cleaner [illegible] then passes to the oil cup where it goes [illegible] a bath of oil. As the air rises to the intake [illegible]d, it passes through a series of oil-bathed [illegible] and the fine dust is removed. As the oil [illegible] the screen works back down, it carries the [illegible]th it and settles in the oil cup. *Never allow [illegible] build up in the cup more than ½ inch deep*

Cup Service

[illegible]move the oil cup by pushing the oil cup bail [illegible] the engine. *See Illust. 37.* Clean and refill [illegible]l cup every day, or every 10 hours of operation [illegible] frequently when operating under dusty [illegible]ons). Refill the oil cup to the oil level bead [illegible] the same grade of oil used in the engine crank

The capacity of the oil cup is ½ U. S. pint the Donaldson Air Cleaner and ¾ U. S. pint the United, whichever type is used (the name [illegible]rs on the air cleaner). Do not remove the oil while the engine is operating. Before replacing oil cup, clean or wipe oil or grit from the top [illegible] of the oil cup.



Oil cup Oil cup bail Hose connections A-48994

Illust. 37

Servicing the oil cup.

Air Intake Cap and Screen

The screen in the air intake cap prevents chaff and other coarse dirt from getting into the air cleaner. Keep this screen clean and free from all chaff, oil, dust, or paint, as clogged holes in the screen will reduce the power of the engine by restricting the flow of air.

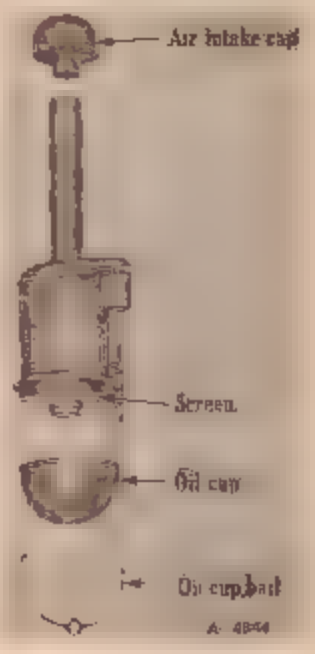
Washing the Cleaner

After every 60 hours of operation—particularly if operating the tractor in an atmosphere heavily laden with dust, chaff or lint—remove the entire air cleaner from the tractor, disassemble it (*Illust. 37A*) and wash the parts thoroughly in kerosene. Be sure to clean out the air intake pipe.

After all parts have been thoroughly cleaned, replace the air cleaner body on the tractor. Make sure all joints are airtight. Replace the air intake cap. Fill the oil cup to the proper level with the specified grade of oil and replace it on the air cleaner. Be sure it is held securely in place by the oil cup bail.

General Precautions

As an added precaution against dirt entering the engine, frequently inspect the flexible rubber hose connections between the carburetor and the air cleaner. If they show any sign of deterioration, replace them. To eliminate strain on the rubber hose connections, be sure the pipes line up. All joints between the air cleaner, carburetor, manifold and cylinders of the engine should be tight. All gaskets must be in good condition and the bolts should be drawn up tight.



Illust. 37A

Exploded view of air cleaner.

Spark Plugs and Cables

Spark Plugs

Caution: Remove all dirt from the base of the spark plug before removing the spark plug.

Remove the spark plugs after every 200 to 300 hours of operation for cleaning and checking the gaps between electrodes. A gap of .023 inch should be maintained. When making this adjustment, always bend the outer electrode. Never bend the center electrode, as it may damage the insulator. If the gap between the electrodes is too great, due to improper setting or burning off of the ends, the engine will misfire and be hard to start.

Illust. 38

Checking the spark plug gap
Set gap at .023 inch.

Cleaning Spark Plugs

Sandblasting is the recommended method of cleaning spark plugs. Never scrape or clean the insulator with anything which will scratch the porcelain. Scratched porcelain allows carbon and dirt to accumulate much faster.

Always use a spark plug wrench when removing or replacing plugs. This helps to prevent cracking the porcelain.

When replacing spark plugs, be sure that the gaskets are in good condition, and screw the plugs in tight.

Replace defective plugs with new plugs.

See your International Harvester dealer for various makes of replacement plugs for normal or special service. These plugs have been tested and recommended as best suited for this engine.

Spark Plug Cables (Magneto Ignition)

If the spark plug cables are removed for any reason, note the position of each cable on the magneto as shown in *Illust. 38A*.

Illust. 38A

Spark plug wiring. Engine firing order is 1, 3, 4, 2.

Spark Plug Cables (Battery Ignition)

If the spark plug cables are removed for any reason, note the position of each cable on the distributor. *Illust. 38B* shows the correct wiring.

Illust. 38B

Spark plug wiring. Engine firing order is 1, 3, 4, 2.

Magneto

Magneto Lubrication

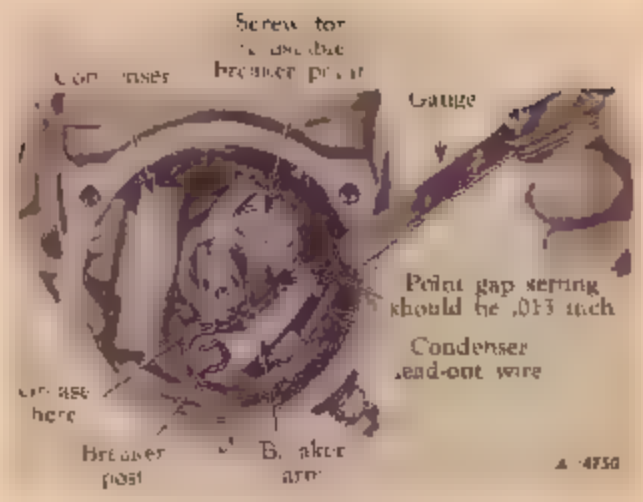
After every 500 hours of operation, fill the magneto rotor bearing oil cup (on mounting flange) (*Illust. 41*) once with the same oil as used in the crankcase.

Greasing the Breaker Mechanism and Checking the Points

It is important that the breaker chamber be kept clean, as oil on the breaker points will cause rapid burning. Inspect the breaker chamber after every 250 hours of operation, to assure that it is clean. To reach the breaker mechanism, remove the distributor cap, and crank the engine slowly until end "B" of the distributor rotor arm points toward the No. 1 terminal on the distributor cap, and the impulse coupling just trips. Take off the distributor body by removing three screws "A" (*Illust. 39*). See that the points are in good condition and have the proper clearance. If the chamber is clean, no attention is necessary other than checking the clearance of the points; but if the chamber is dirty, all parts must be thoroughly cleaned.

Do not crank the engine while distributor body is removed or it might be necessary to retime the magneto to the engine.

Remove the breaker arm from the chamber and clean all parts. Inspect the breaker points and, if necessary, dress them with a sharp, fine file. If the points are worn excessively, replace both points.



Illust. 39A
Adjusting the breaker points.

Fill the recess in the breaker post with grease and pack a small quantity of magneto grease in back of the breaker arm rubbing block (*Illusts. 39 and 39A*). See your International Harvester dealer for the proper grease to use.

Replace the breaker arm and be sure the points line up when the breaker arm is in place.

Check the opening between the breaker points (*Illust. 39A*) with a feeler gauge. The point opening should be .013 inch when the rubbing block is on the high part of the cam. If the opening is not correct, adjust it by loosening the screw holding the

Continued on next page

Illust. 39
Magneto disassembled.

Greasing the Breaker Mechanism and Checking the Points—Continued

adjustable point (*Illust. 39A*) and moving the point up or down until the gauge slips snugly into the opening. After the proper adjustment has been made, tighten the screw

With the engine on the top dead center of the No. 1 firing stroke, turn the distributor rotor until end "B" of the distributor rotor arm points to the No. 1 terminal on the distributor cap. Place the distributor body on the magneto and be sure the rotor shaft enters the "D" shaped hole in the magneto rotor pinion. Be sure the gasket is in place and tighten three screws "A" (*Illust. 39*). Replace the distributor cap.

Greasing the Distributor Gear

After every 2,000 hours of operation or at least every year, the distributor gear and distributor gear chamber should be cleaned and repacked with IH magneto grease. We recommend this be done by your International Harvester dealer

Distributor Cap

Every three or four months, remove the distributor cap and examine the inside. If any dust, moisture or oil deposits are present, thoroughly clean and wipe dry To assure long life of the distributor, care must also be taken to keep the three small ventilator holes in the bottom of the distributor cap open at all times. Also see that the distributor rotor is kept clean

If the distributor cap terminal nipples are removed, be sure that the terminals and coil cover terminals are clean and dry

The magneto is equipped with these nipples to prevent any external electrical leakage when the tractor is operating under adverse conditions.

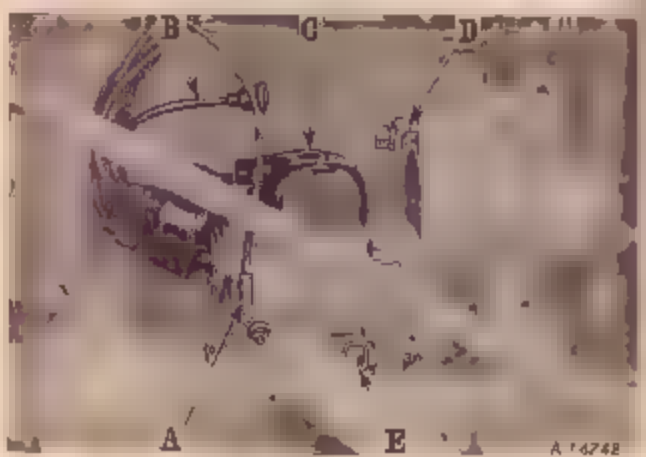
Magneto Impulse Coupling and Magneto Drive Chamber

When the engine is hand-cranked, the impulse coupling should trip (click) twice for each revolution of the engine. Failure to do so indicates the need of cleaning or service.

Remove the magneto as described below. Hold the magneto at an angle of approximately 45 degrees, and flush the impulse coupling and magneto drive chamber with kerosene. During warm weather, the impulse coupling liberally with light oil, such cream separator or sewing machine oil Do not oil during cold weather (below +32° F.). Flushing with kerosene is all that is required,

If it is necessary to remove the impulse coupling from the magneto for cleaning or service, we recommend that this be done by your International Harvester dealer

Removing the Magneto



Illust. 40

Removing the magneto

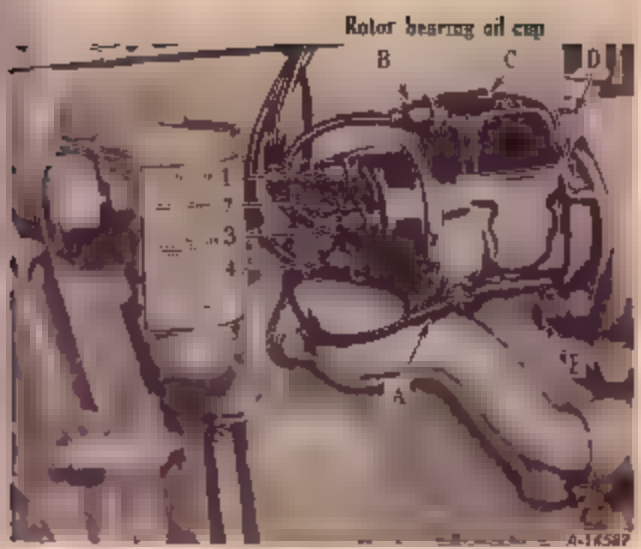
1. Disconnect switch cable "A" (*Illust. 40*) by removing the nut and lock washer attaching the cable to the magneto terminal

2. Pull out cable "B" from coil cover "C" and remove the distributor cap.

3. Loosen the nut holding magneto mounting clip "D" and remove cap screw "E." The magneto assembly can then be removed. *See Illust. 40*

Installing and Timing the Magneto to the Engine

1. Crank the engine until the No. 1 piston (the piston next to the radiator) is on the upper dead center of the compression stroke. The compression stroke can be determined by removing the No. 1 spark plug, placing the thumb over the opening, and cranking the engine until an outward pressure is felt. Continue cranking slowly until the 'I D.C' mark (second notch) on the back flange of the fan drive pulley (on the crankshaft) is in line with pointer on front crankcase cover. *See Illust. 41A.* Both intake and exhaust valves will then be closed



Illust. 41

Magneto wiring (clockwise rotation).

Illust. 41B

Magneto removed showing impulse coupling

2. Turn the magneto impulse coupling (*Illust. 41B*) in a counter-clockwise direction (as viewed from the coupling end) until end 'B' of the distributor rotor arm points toward the No. 1 terminal on the distributor cap. *See Illust. 39.* Then replace the distributor cap.

3. Assemble the magneto on the engine, making sure that the lugs on the impulse coupling engage in the slots on the magneto drive coupling. (Assemble the magneto so that the top is as close to the crankcase as possible.)

4. Insert magneto mounting bolt "F" (*Illust. 40*) loosely in the magneto flange, just enough to hold the magneto in place. Then crank the engine one complete revolution to the next top dead center. Now pull the upper part of the magneto away from the engine until the impulse coupling just trips.

5. Tighten mounting clip nut "D" and bolt "E" (*Illust. 40*) securely. If the spark plug cables have been removed for any reason, attach the cables to the engine and magneto. Start by connecting the No. 1 cylinder spark plug to the socket marked '1' on the distributor cap *in Illust. 38A.* Then connect the No. 3 socket with the No. 3 cylinder; next the No. 4 socket with the No. 4 cylinder, and last, the No. 2 socket with the No. 2 cylinder. *See Illusts. 38A and 41.*

6. Connect the switch cable to the magneto terminal.

7. To check the timing, crank the engine slowly until the top dead center of the No. 1 cylinder is reached, at this time the impulse coupling should just trip.

8. The magneto is now correctly wired and timed.

9. Push cable 'B' back into the socket in the coil cover. *See Illust. 41.*

Illust. 41A

Notches on the fan drive pulley and the timing pointer.

Battery Ignition Unit

Lubrication

Every six months or after every 500 hours of operation, whichever occurs first, remove the grease plugs (*Illust. 42*) and insert lubrication fittings. Apply pressure-gun grease (chassis lubricant) to the distributor fitting until a small quantity comes out

Illust. 42

Distributor wiring and lubrication

of the relief hole opposite the plug. Apply several strokes of the grease gun to the drive housing fitting.

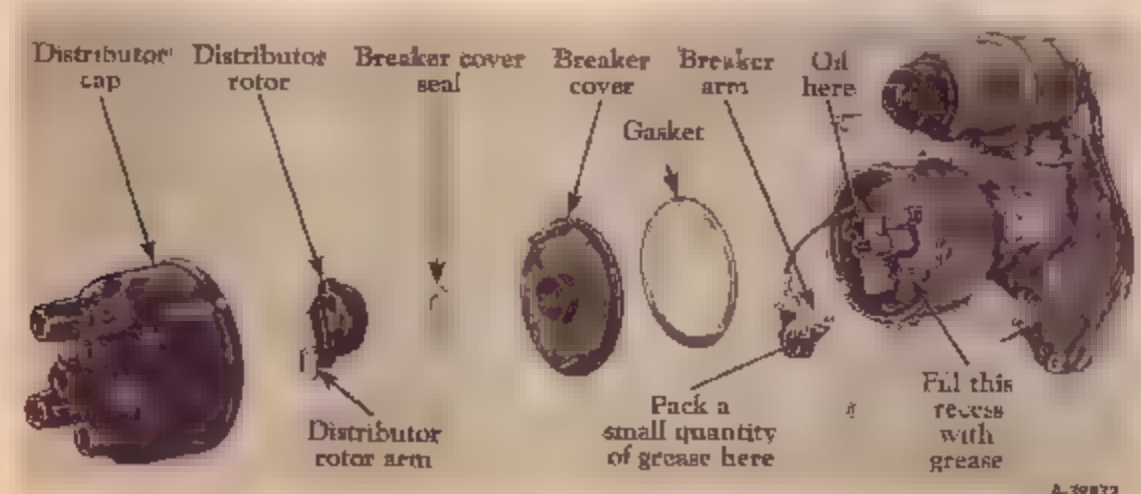
Remove the distributor cap and the distributor rotor and apply one or two drops of light engine oil to the felt in the hole at the end of the breaker cam. *See Illusts. 42A and 42B.*

Illust. 42B

Adjusting the breaker points.

Greasing the Breaker Mechanism and Checking the Points

It is important that the breaker chamber be kept clean because oil on the breaker points will cause rapid burning. Remove the distributor cap, distributor rotor, and the breaker cover for breaker chamber inspection. *See Illust. 42A.* Care should be taken, when removing the breaker cover, to prevent dirt from entering the breaker chamber. Be sure the chamber is clean and that the breaker points are in good condition and have the proper opening



Illust. 42A

Distributor partially disassembled for servicing.

Never use emery cloth or sandpaper to clean the [illegible] If the points are worn excessively, replace [illegible] points.

[illegible] the recess in the breaker post with grease and [illegible] a small quantity of magneto grease in back of [illegible] breaker arm rubbing block and apply a light [illegible]ng of the same grease on the lobes and flats of [illegible] breaker cam. *See Illusts. 42A and 42B.* See your [illegible]ternational Harvester dealer for the proper grease [illegible]se.

Check the condition of the breaker points for [illegible]ld-up or lip formation. If present, the points [illegible] be dressed before the point opening can be [illegible]ked or set. Check the opening between the [illegible]aker points with a feeler gauge as shown *in Illust. [illegible]8.* The point opening should be .020 inch when [illegible] rubbing block is on the high part of the cam. [illegible] the opening is not correct, adjust it by loosening [illegible]e screw holding the adjustable point. Then [illegible]ve the point toward or away from the point on the [illegible]eaker arm until the gauge slips snugly into the [illegible]pening. After the adjustment has been made, tighten the screw

Distributor Cap

Every three or four months remove the distributor cap and examine the inside. If any dust, moisture or oil deposits are present, thoroughly clean and wipe dry. To assure long life of the distributor, care must be taken to keep the three small ventilator holes in the distributor cap open at all times. Also see that the distributor rotor is kept clean.

If the terminal nipples are removed, be sure the distributor cap terminals and coil terminal are clean and dry. The distributor is equipped with these nipples to prevent any external electrical leakage when the tractor is operating under adverse conditions.

Ignition Coil

The ignition coil does not require special service other than to keep all terminals and connections clean and tight.

Removing the Battery Ignition Unit

If it is necessary to remove the battery ignition unit for any reason, proceed as follows:

1. Disconnect ignition switch cable "C" (*Illust. 44*) from the ignition coil.

2. Pull secondary cable "A" (*Illust. 44A*) out of the center socket on the distributor cap and remove the cap

3. Crank the engine slowly until the distributor rotor arm is in the No. 1 firing position. *See Illust. 44.*

4. Remove the two cap screws and the mounting clip from the distributor drive housing flange and remove the complete unit

Installing the Battery Ignition Unit

Note: If the gears on the drive shaft have not been disengaged or rotated at any time after the complete unit has been removed, disregard the following steps 1 and 2. Also it should not be necessary to retime the distributor to the engine.

1. Place the battery ignition unit in one hand and, with the fingers of the other hand, turn the drive lugs in a clockwise direction until the rotor arm is approximately in the No. 1 firing position. *See Illust. 43.* Then continue to turn slowly and lightly until a slight resistance is felt.

Continued on next page

Illust. 43

Adjusting the distributor rotor and drive shaft lugs for timing the distributor

Installing the Battery Ignition Unit—Continued

Illust. 44

Assembling the battery ignition unit.

Illust. 44A

Advancing the distributor while holding the secondary cable ¼ to ⅛" from the primary terminal

2. Pull out the drive shaft to disengage the gears, then turn the shaft clockwise so drive shaft lugs "A" are approximately 35° past horizontal or approximately in the same position as drive shaft slots "B." *See Illust. 44.* Engage the gears and press the drive shaft in with the palm of the hand.

3. Assemble the battery ignition unit and gasket and fasten with the mounting bolts and washers, using the mounting clip in front of the lock washer on the top bolt. Assemble the distributor cap.

4. Connect switch cable "C" (*Illust. 44*) to the negative (—) terminal on the ignition coil.

Timing the Distributor to the Engine

Loosen distributor mounting bolts "B" *See Illust. 44A.* Set the engine on the top dead center of the No. 1 firing stroke by cranking the engine until the No. 1 piston (the piston next to the radiator) is on the upper dead center of the compression stroke.

The compression stroke can be determined by removing the No. 1 spark plug, placing your thumb over the opening, and cranking the engine until an outward pressure is felt. The secondary cable should be assembled properly in the coil terminal.

Pull out the knob of the ignition switch and note whether the charge indicator shows discharge. If the charge indicator shows discharge, the points are closed and retarding the distributor is not necessary. If the charge indicator does not show discharge, retard the distributor by turning the body about 30° in the same direction as the cam rotation.

Illust. 44B

Showing the secondary cable held under the distributor cap spring for final check of timing

Hold the free end of secondary cable "A" within ⅛ inch to ¼ inch from the distributor primary terminal, as shown *in Illust. 44A.* Advance the distributor by turning the distributor body slowly in a direction opposite to the cam rotation until a spark occurs.

Place the secondary cable under the distributor cap spring and place the terminal within 1/16 inch to ⅛ inch of the distributor primary terminal as shown *in Illust. 44B.* Make a final check by cranking the engine until the TDC mark (second notch) on the back flange of the fan drive pulley is in line with the pointer on the front crankcase cover (*see Illust. 45*) and continuing until the spark just occurs at the gap between the secondary cable and the primary terminal. The timing marks should just be in line or slightly past top dead center (never time before top dead center). If necessary, make the required adjustment to have the spark occur as specified. Retighten the distributor mounting bolts.

If the spark plug cables have been removed for any reason attach the cables to the spark plugs and to the terminal sockets of the distributor cap in the following order: The No. 1 cylinder spark plug cable to the socket marked "1" *in Illust. 38B.* Then, going around the distributor cap in a clockwise direction, attach the cable from the No. 3 spark plug to the next or second socket, the cable from the No. 4 spark plug to the next or third socket, and the cable from the No. 2 spark plug to the fourth or last socket. Assemble the secondary cable "A" in the distributor cap. *See Illust. 42.*

Power Timing Light

An accurate and fast final check and adjustment of ignition timing is possible with a neon-type timing light, using TDC (top dead center) timing marks and running the engine at low idle speed. This light requires that the timing marks on the fan drive pulley be whitened with white lead or chalk to make them more visible, and the low idle speed of the engine be adjusted to 375 r.p.m. maximum. A higher engine speed will cause the automatic spark advance to function, thus advancing the spark to occur before TDC.

Timing and Checking For Full Ignition Advance

Operate the engine at maximum idle speed (2,016 r.p.m.). Direct the timing light on the pointer and timing mark, the first notch (16° spark advance) on

Illust. 45

Notches on the fan drive pulley and the timing pointer

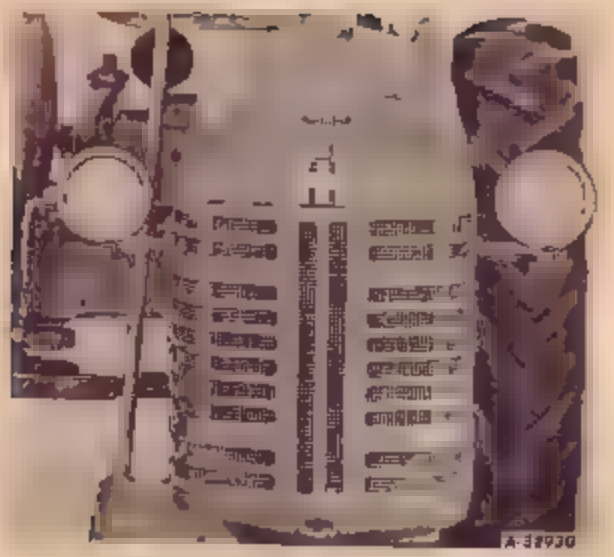
the fan drive pulley. *See Illust. 45.* The distributor is correctly timed when the timing mark is aligned with the pointer. If the timing mark does not align with the pointer, loosen and rotate the distributor in its mounting until the mark on the pulley is in line with the pointer. After the above adjustment has been made, reduce the engine speed to adjusted speed of 375 r.p.m. maximum. The TDC mark (second notch) on the pulley should align with the pointer or be slightly past the pointer in the direction of rotation. If the timing mark is before the pointer, rotate the distributor until the TDC mark is in line with the pointer. Never time the spark to occur before top dead center.

After the above checks or adjustments have been made, readjust engine to low idle minimum (governed) speed (450 to 500 r.p.m.).

Instructions for the proper hook-up and operation of the power timing light are furnished with the tool by the manufacturer.

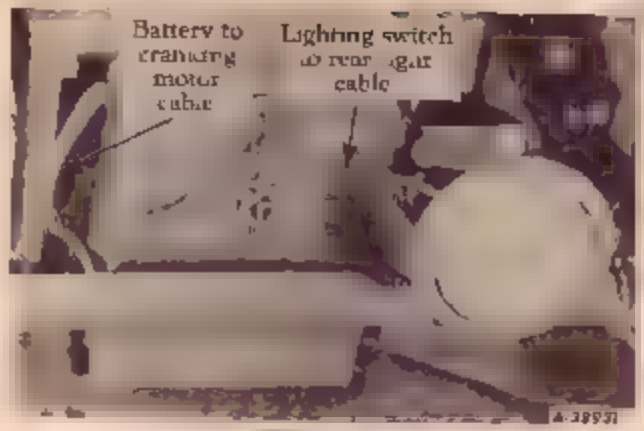
Starting and Lighting Equipment

(Tractors with Magneto)



Illust. 46

Headlights and connections.



Illust. 46B

Rear light and battery box.

Description

The electrical system of the tractor is a six-volt system and consists of a magneto, generator, voltage regulator, cranking motor, lights, lighting switch and a six-volt battery. Colored plastic-covered cables are contained in a harness of non-metallic oilproof and waterproof woven braid.

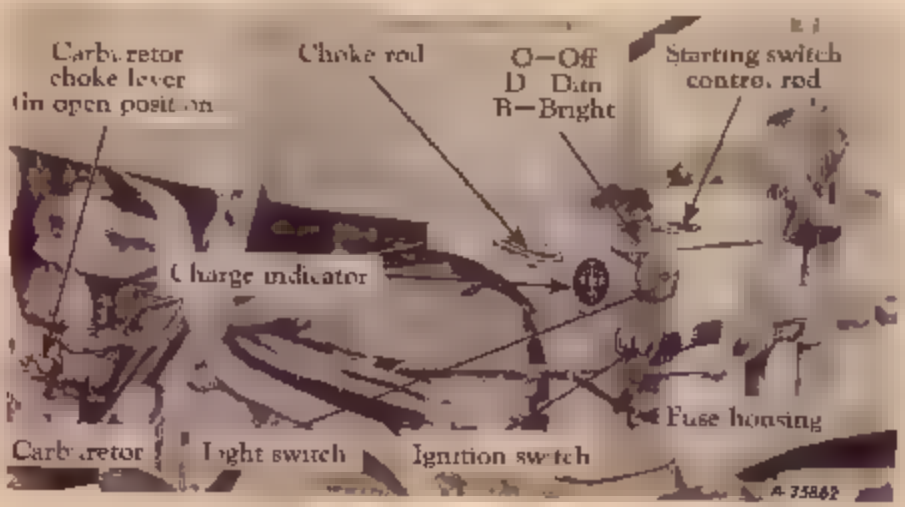
Use the illustrations *on pages 46 to 49* and the wiring diagram *on page 50* as a guide for identifying the various electrical units and for tracing the electrical cables and connections. Be sure all terminals are clean and securely fastened.

Lighting Switch

The lighting switch has three positions: "O"—off position, "D"—dim lights, and "B"—bright lights. *See Illust. 46A*

Battery and Cables

When the electrical equipment is installed at the factory, the battery ground cable (*Illust. 47*) is disconnected and taped. Before attempting to start the tractor, make certain that the ground cable is connected



Illust. 46A

Lighting switch and charge indicator.

Illust. 47

Battery and cables

Before working on any part of the electrical system, disconnect the battery ground cable. See Illust. 47 Do not reconnect this cable until all electrical work has been completed. This will prevent shorting and causing damage to any of the electrical units.

Generator and Regulator

The generator supplies current to keep the battery in a charged condition, and to replace the energy consumed by the cranking motor and lights. The generator on your tractor is sealed to prevent the entrance of dirt and moisture. It is hinge-mounted on the right side of the engine crankcase and is driven by a V-belt from the fan pulley. The generator, as received from the factory, has a fixed third brush which is set to give the maximum generator output

The generator charging rate is controlled by a voltage regulator which controls the generator output, thereby maintaining a satisfactory charging rate, and prevents the battery from overcharging under varying temperatures and operating conditions. It should not require adjustment or attention. If the regulator fails to operate correctly, replace it with a new one or see your International Harvester dealer

Caution: Do not at any time place a jumper lead between or accidentally bridge the battery terminal and the field terminal on the regulator Serious damage to the regulator may result.

Polarizing the Generator

If the generator or the regulator has been removed or the leads disconnected, the generator should be repolarized. After the leads have been reconnected, but before the engine is started, proceed as follows.

After making certain that the grounded battery terminal is the positive (+) one, momentarily connect a jumper lead between the "BAT" terminal of the regulator and the "A" terminal of the generator. This allows a momentary surge of current to flow through the generator which correctly polarizes it. Reversed polarity may result in vibration, arcing and burning of the relay contact points.

Important! Do not touch the jumper lead to the "F" terminal on the generator, as this will damage the regulator.

Illust. 47A

Removing the hood and fuel tank.

Servicing the Generator

To service the generator, it is necessary to remove the hood and fuel tank assembly as described below

Removing the Hood and Fuel Tank

1. Remove the radiator cap and air cleaner cap. Disconnect each headlight cable "A" (*Illust. 47A*), and pull the cables through the holes in the hood

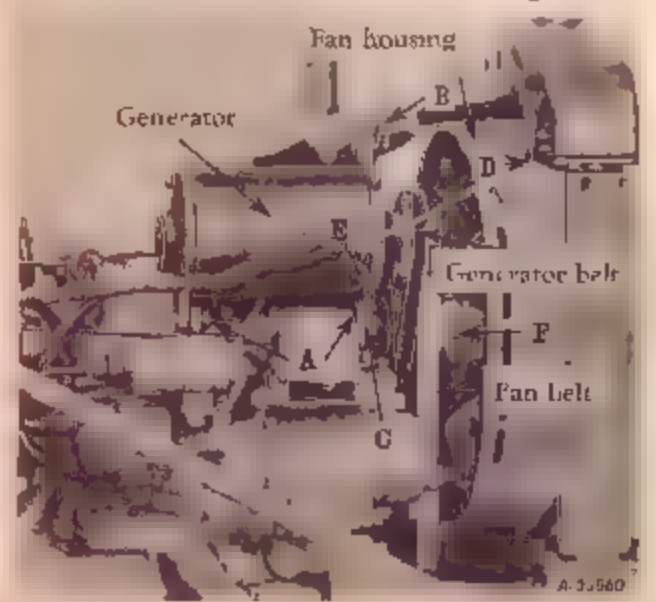
2. Close the fuel strainer shut-off valve underneath the gasoline tank (*Illust. 8*) and disconnect the fuel line at the fuel strainer

3 Remove the radiator screen by unscrewing screws "B" (*Illust. 47A*) on each side of the radiator screen. Remove screws "C" and cap screws "D" on each side of the radiator Remove the four screws at the hood and fuel tank support "E." Remove screw "F" and allow the electrical cables to drop free from the hood.

4. Lift the hood and fuel tank assembly up and over the air cleaner pipe. Carefully place the assembly on the floor and block up the fuel tank end so as not to damage the fuel strainer or gasoline tank.

Generator Belt Tension

Check the slack of the generator belt after every 60 hours of operation to assure maintenance of the correct tension. The belt should never be loose enough to allow slippage but should not be so tight as to cause excessive side-thrust on the generator bearing. Allow approximately ¼ inch slack. *See Illust. 36.*



Illust. 48

Generator belt.

Adjusting the Generator Belt

Loosen two nuts "A" and cap screw "B" (*Illusts. 48 and 48A*) and move the generator toward or away from the engine. After getting the correct tension, tighten nuts "A" and cap screw "B."

Removing the Generator Belt

1. Loosen two nuts "A" and cap screw "B" (*Illusts. 48 and 48A*). Move the generator in toward the engine and remove the belt from the generator pulley

2. Loosen fan spindle "C" (*Illusts. 48 and 48A*) and slide the fan and hub assembly to the bottom of the groove in the fan bracket.

3. Slip the generator belt through the fan belt and work it up over the fan blades.

Replacing the Generator Belt

Replace the generator belt when it becomes soaked with grease or badly worn

When replacing the belt, reverse the procedure outlined under *"Removing the Generator Belt."* Adjust the fan belt and generator belt as described *on pages 36 and 48.*

Illust. 48A

Cleaning the generator commutator

Cleaning the Generator Commutator

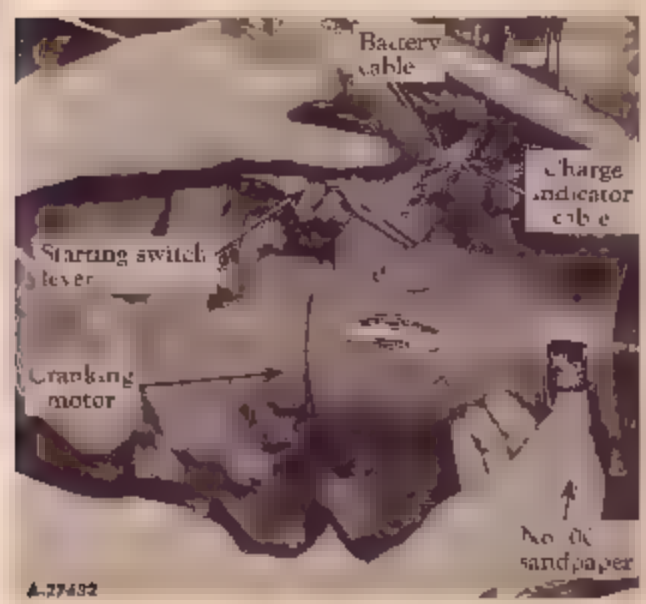
If the commutator is dirty or slightly grooved, it can be polished by placing a piece of No. 00 sandpaper on the commutator while the armature is slowly revolving. *See Illust. 48A. Never use emery or carborundum cloth.* Blow all dust from the commutator after the polishing operation is finished.

If the commutator is badly worn, rough or out-of-round it is advisable to take the unit to your International Harvester dealer, and have the commutator reconditioned

Generator Lubrication (Two Cups)

Follow the lubricating instructions for the generator as outlined *in the "Lubrication Guide."* Do not lubricate excessively, since excessive oiling may cause the oil and grease to gum on the commutator, and will result in a reduction of the generator output and increased commutator and brush wear

Never oil the commutator or lubricate the generator while it is in operation.



Illust. 49

Cleaning the cranking motor commutator.

Cranking Motor

The cranking motor is mounted on the right side of the clutch housing

At regular intervals, remove the cranking motor commutator cover and inspect the commutator

To clean the commutator, pull out cable "B" (*Illust. 41*) from the magneto coil cover. Remove the cranking motor cover band. Depress the starting switch by pulling back on the starting switch control lever and, with the cranking motor operating, insert a piece of No. 00 sandpaper over the commutator to clean off dirt and discoloration. *See Illust. 49. Never use emery or carborundum cloth.* Always blow out the commutator compartment after cleaning.

Cranking Motor Lubrication

The cranking motor has oil-less type bushings at both the commutator and drive ends and requires no lubrication except when the cranking motor is removed for service repairs.

At this time it is recommended that a few drops of light engine oil be applied to both bushings.

Removing the Cranking Motor

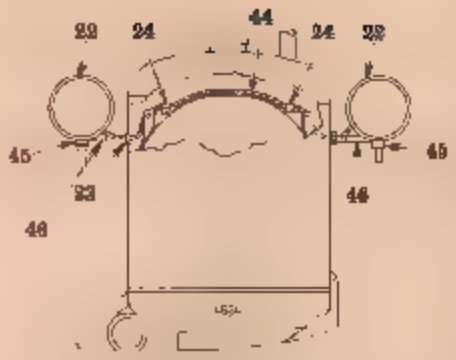
1. Disconnect the ground cable from the battery.

2. Remove the battery cable and the charge indicator cable from the terminal on the cranking motor switch. *See Illust. 49*

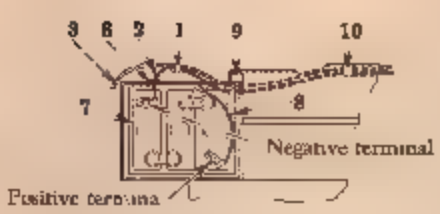
3. Remove the two cap screws which hold the cranking motor to the crankcase and lift the complete cranking motor forward and away from the engine.

Installing the Cranking Motor

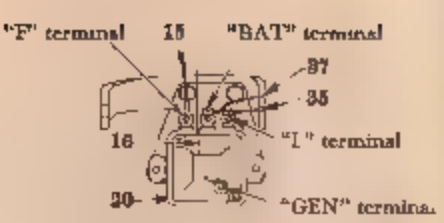
To install the cranking motor, reverse the removal procedures.



View showing headlight and connections



View showing battery connections



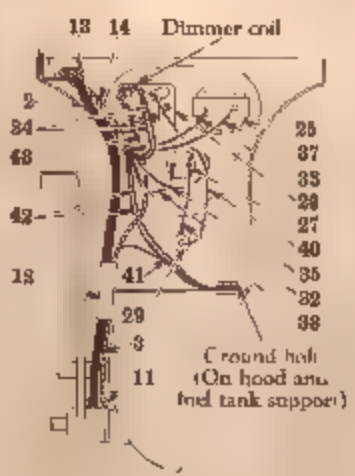
View showing voltage regulator connections

Enlarged view of regulator "I" terminal and generator bracket mounting bolt

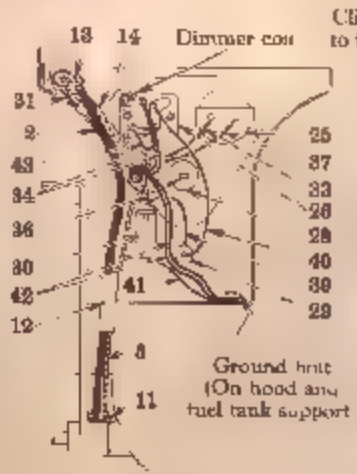
View showing rear light and battery connections

Right side view showing generator, regulator, cranking motor, battery and rear light connections

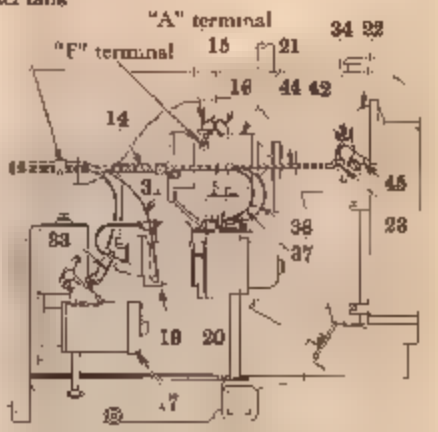
View showing battery cable assembly



View of instrument panel (Battery ignition)



View of instrument panel (Magneto ignition)



Magneto ignition

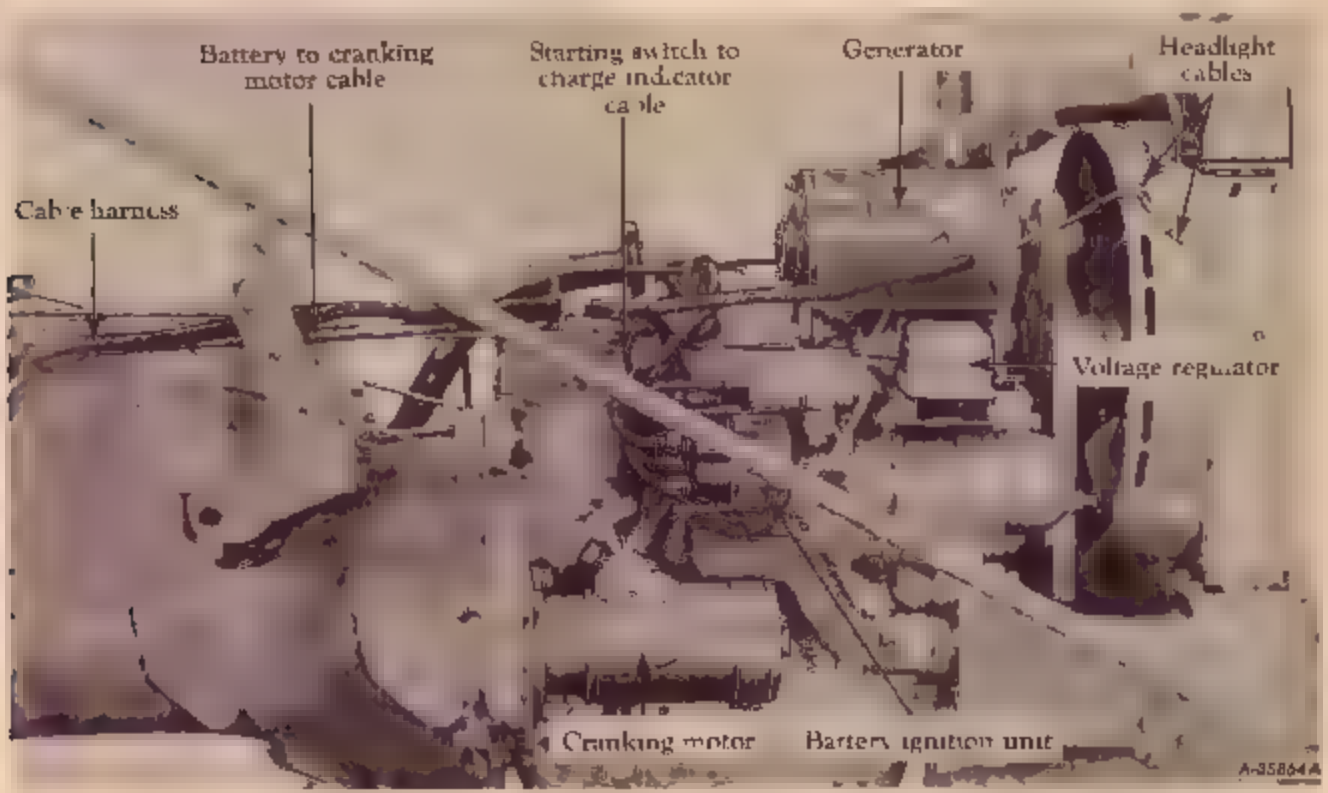
Illust. 50

Wiring diagram for starting and lighting.

Index to Reference Numbers shown in illustration on opposite page

Ref. No.	Description	Ref. No.	Description
1	Wrapping strap.	26	Lighting switch.
2	Cable—battery to cranking motor.	27	Battery ignition switch.
3	Harness cable—rear light.	28	Magneto ignition switch.
4	Clip on rear light mounting bracket (upper bolt).	29	Fuse housing.
5	Rear light.	30	Junction block.
6	Grommet—battery box.	31	Cable—magneto ignition switch to magneto.
7	Battery.	32	Cable—battery ignition switch to coil (orange).
8	Cable—battery to ground.	33	Cable—charge indicator to starting switch (brown).
9	Clip on rear bolt (underneath platform).	34	Cable—switch to headlight (black).
10	Clip on third bolt from rear (underneath platform).	35	Cable—regulator "I" terminal to switch (light green).
11	Wrapping strap—between pedal and clutch housing.	36	Cable—regulator "I" terminal to junction block (light green).
12	Clip on inside right side fuel tank support.	37	Cable—regulator "BAT" terminal to charge indicator (gray).
13	Clip on inside edge of hood support (right side).	38	Cable—fuse housing to ignition switch.
14	Cable harness.	39	Cable—fuse housing to junction block.
15	Cable—generator "F" terminal to regulator "F" terminal.	40	Cable—fuse housing to lighting switch.
16	Cable—generator "A" terminal to regulator "GEN" terminal.	41	Cable—rear light to ground (pink).
17	Cranking motor.	42	Cable—headlight to ground (pink).
18	Battery ignition unit.	43	Cable—lighting switch to rear light (black).
19	Magneto.	44	Harness—headlight cable.
20	Voltage regulator.	45	Spacer—headlight.
21	Generator.	46	Post—headlight.
22	Headlight.	47	Spacer—rear light.
23	Grommet (in hood).	48	Clamp—rear light.
24	Clips on upper right and left sides of fan housing.	49	Bracket—rear light.
25	Charge indicator.		

Starting and Lighting Equipment
(Tractors with Battery Ignition)



Illust. 51
Cranking motor, generator, voltage regulator and cables.

Description

The electrical system of the tractor is a six-volt system and consists of a generator, voltage regulator, cranking motor, lights, lighting switch and a battery ignition unit with a six-volt battery.

Use *Illust. 51* and the wiring diagram *on page 50* as a guide for identifying the various electrical units and for tracing the electrical cables and connections. Be sure all terminals are clean and securely fastened.

When the electrical equipment is installed at the factory, the battery ground cable (*Illust. 47*) is disconnected and taped. Before attempting to start the tractor, make certain that the ground cable is connected

Lighting Switch

The lighting switch has three positions "O"—off position, "D"—dim lights, and "B"—bright lights *See Illust. 46A*

Generator and Regulator

The generator supplies current to keep the battery in a charged condition, replacing the energy consumed by the starting motor and lights. The generator on your tractor is sealed to prevent the entrance of dirt and moisture It is hinge-mounted on the right side of the engine crankcase and is driven by a V-belt from the fan pulley. The generator, as received from the factory, has a fixed third brush which is set to give the maximum generator output

The generator charging rate is controlled by a voltage regulator which controls the generator output, thereby maintaining a satisfactory charging rate, and prevents the battery from overcharging under varying temperatures and operating conditions. It should not require adjustment or attention. If the regulator fails to operate correctly, replace it with a new one or see your International Harvester dealer.

Caution! Do not at any time place a jumper lead between or accidentally bridge the battery terminal and the field terminal on the regulator. Serious damage to the regulator may result.

Polarizing the Generator

If the generator or the regulator has been removed or the leads disconnected, the generator should be repolarized. After the leads have been reconnected, but before the engine is started, proceed as follows:

After making certain that the grounded battery terminal is the positive (+) one, momentarily connect a jumper lead between the "BAT" terminal of the regulator and the "A" terminal of the generator. This allows a momentary surge of current to flow through the generator which correctly polarizes it. Reversed polarity may result in vibration, arcing and burning of the relay contact points.

Important! Do not touch the jumper lead to the "F" terminal on the generator as this will damage the regulator

Servicing the Generator

To service the generator, it is necessary to remove the hood and fuel tank assembly as described below.

Removing the Hood and Fue Tank

1 Remove the radiator cap and air cleaner cap Disconnect each headlight cable "A" (*Illust. 47A*) and pull the cables through the holes in the hood

2 Close the fuel strainer shut-off valve underneath the gasoline tank (*Illust. 8*) and disconnect the fuel line at the fuel strainer.

3. Remove the radiator screen by unscrewing screws "B" (*Illust. 47A*) on each side of the radiator screen. Remove the screws at "C" and cap screws "D" on each side of the radiator. Remove the four screws at the hood and fuel tank support "E." Remove screw "F" and allow the electrical cables to drop free from the hood

4. Lift the hood and fuel tank assembly up and over the air cleaner pipe. Carefully place the assembly on the floor and block up the fuel tank end so as not to damage the fuel strainer or gasoline tank.

Generator Belt Tension

Check the slack of the generator belt after every 60 hours of operation to assure maintenance of the correct tension. The belt should never be loose enough to allow slippage but should not be so tight as to cause excessive side-thrust on the generator bearing. Allow approximately ¼-inch slack. *See Illust. 36.*

Adjusting the Generator Belt

Loosen two nuts "A," and cap screw "B" (*Illusts. 48 and 48A*), and move the generator toward or away from the engine. After getting the correct tension, tighten nuts "A" and cap screw "B"

Removing the Generator Belt

1. Loosen two nuts "A" and cap screw "B" (*Illusts. 48 and 48A*). Move the generator in toward the engine and remove the belt from the generator pulley.

2. Loosen fan spindle "C" (*Illusts. 48 and 48A*) and slide the fan and hub assembly to the bottom of the groove in the fan bracket.

3. Slip the generator belt through the fan belt and work it up over the fan blades.

Replacing the Generator Belt

Replace the generator belt when it becomes soaked with grease or badly worn.

When replacing the belt, reverse the procedure *outlined under "Removing the Generator Belt."* Adjust the fan belt and generator belt as described *on pages 36 and 48.*

Cleaning the Generator Commutator

Illust. 53

Cleaning the generator commutator

If the commutator is dirty or slightly grooved, it can be polished by placing a piece of No. 00 sand paper on the commutator while the armature is slowly revolving. *See Illust. 53. Never use emery or carborundum cloth.* Blow all dust from the commutator after the polishing operation is finished.

If the commutator is badly worn, rough or out-of round, it is advisable to take the unit to your International Harvester dealer and have the commutator reconditioned.

Generator Lubrication

Follow the lubricating instructions for the generator *as outlined in the "Lubrication Guide."* Do not lubricate excessively, since excessive oiling may cause the oil and grease to gum on the commutator, and will result in a reduction of the generator output and increased commutator and brush wear.

Never oil the commutator and do not lubricate the generator while it is in operation.

Cranking Motor

The cranking motor is mounted on the right side of the engine crankcase, in front of the clutch housing.

At regular intervals, remove the cranking motor cover band and inspect the commutator.

Cleaning the Cranking Motor Commutator

Illust. 53A

Cleaning the cranking motor commutator.

To clean the commutator, pull out cable "A" (*Illust. 42*) from the center socket on the distributor cap. Remove the cranking motor cover band. Depress the starter switch by pulling back on the starting switch control rod and, with the cranking motor operating, insert a piece of No. 00 sandpaper over the commutator to clean off dirt and discoloration. *See Illust. 53A. Never use emery or carborundum cloth.* Always blow all dust from the commutator compartment after cleaning.

Cranking Motor Lubrication

The cranking motor has oil-less type bushings at both the commutator and drive ends, and requires no lubrication except when the cranking motor is removed for service repairs.

At this time it is recommended that a few drops of light engine oil be applied to both bushings.

Removing the Cranking Motor

1. Disconnect the ground cable from the battery.

2. Remove the battery cable and the charge indicator cable from the terminal on the cranking motor switch. *See Illust. 53A.*

3. Remove the two cap screws which hold the cranking motor to the crankcase and remove the complete cranking motor.

To install the cranking motor, reverse the removal procedures.

Fuse

A cartridge-type SFE-20 fuse is located in the housing near the bottom of the instrument panel (*Illust. 46A*). It is important to use the same capacity fuse for replacement. If the lights fail, check the fuse. If the fuse continually burns out, check the electrical wiring for short circuits.

Headlights and Rear Light

The headlights and rear light on your tractor are sealed-beam lights especially developed for farming operations. The parts are so constructed that the filament, reflector, lens and gasket are all assembled in a unit permanently sealed against dirt, moisture and corrosion. If a filament burns out or a lens breaks, the complete unit must be replaced. See your International Harvester dealer.

Storage Battery

Electrical energy, obtained through chemical action, is stored in the battery to be used for starting the engine and for furnishing electric lighting. It is not the source of electricity but only a storage reservoir for use when the generator is not running. In starting, for instance, the battery supplies the energy, but as soon as the engine starts, the generator output begins to replace the electricity taken from the battery.

You will receive maximum satisfactory service from your battery by closely following a few simple precautions and service operations.

A registration card is furnished with the battery. The purchaser of a new battery should take the card to the International Harvester dealer for registration.

Complete instructions for dry, charged batteries (used for export) are included with the battery.

Cleaning and Servicing the Battery

Battery cable terminals must be kept clean and tight. Use hot water for cleaning the top of the battery. Brighten the terminal contact surface with wire wool, and reassemble. Be sure the terminals are clamped tightly and that the battery is fastened securely in the battery box. Replace unserviceable cables. Keep the vent holes in the battery filler caps open.

Liquid Level

The electrolyte (acid and water) in each cell should be at star level at all times to prevent battery failure. When the electrolyte is below this level, pure, distilled water should be added. If your battery is equipped with automatic liquid leveling devices, follow the directions furnished with the battery or consult your International Harvester dealer. Never use hydrant water or any water which has been in a metal container. Keep pure, distilled water on hand in a glass jar for battery use only. Use a clean syringe when adding water and be careful not to allow dirt or corrosive salts to enter the cells.

Acid or electrolyte should never be added except by a skilled battery man. Under no circumstances add any special battery "dopes," solutions or powders.

Caution! Electric storage batteries give off highly inflammable hydrogen gas when charging and continue to do so for some time after receiving a steady charge.

Do not under any circumstances allow an electric spark or an open flame near the battery. Do not lay tools across battery terminals as this may result in a spark or short circuit which may cause an explosion. Be careful to avoid spilling any electrolyte on hands or clothing.

Specific Gravity

The specific gravity of the electrolyte indicates the active condition of the battery charge and warns when it may be necessary to recharge the battery.

Inspect the battery once every two weeks to maintain the correct specific gravity. The specific gravity of a fully charged battery is 1.255 to 1.280 corrected to + 80° F. (liquid temperature). A specific gravity reading of at least 1.230 corrected to + 80° F. should be maintained. Never allow the battery to fall below 1.230.

The specific gravity reading will vary with the temperature of the electrolyte. For readings taken at any temperature other than + 80° F., a temperature correction must be applied. This is done by adding .004 specific gravity for every 10° above + 80° F., and by subtracting .004 specific gravity for every 10° below + 80° F.

Example No. 1

Hydrometer reading	1.270
Electrolyte temperature	+ 20° F.
Subtract .024 Sp. Gr.	(.004 x 6)
Corrected Sp. Gr. is	1.246

Example No. 2

Hydrometer reading	1.255
Electrolyte temperature	+ 100° F.
Add .008 Sp. Gr.	(.004 x 2)
Corrected Sp. Gr. is	1.263

Use an accurate hydrometer when testing for specific gravity. Readings should not be taken immediately after adding water. All cells should show approximately the same specific gravity reading. Wide variations indicate something is wrong.

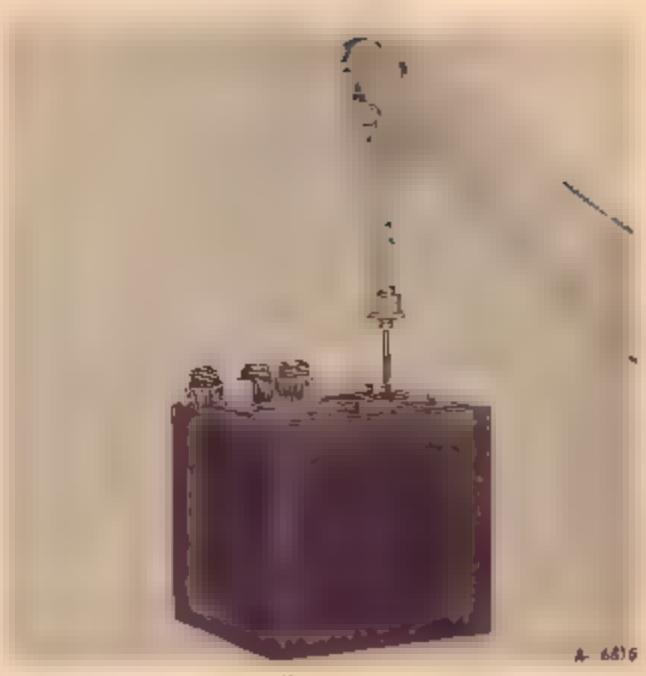
For dependable battery service see your International Harvester dealer.

Battery Voltage

With the battery fully charged and on charge at the normal rate, the average cell voltage at + 80° F. ranges between 2.5 and 2.7 volts; at + 100° F. between 2.4 and 2.6 volts.

Cold Weather Operation

It is especially important to keep the battery close to full charge for cold weather operation. Add water to the battery in freezing temperatures only when the tractor is to operate for several hours, to thoroughly mix the water and electrolyte, or damage to the battery will result from the water freezing.



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Illust. 35

Taking a hydrometer reading of electrolyte in the battery

The electrolyte of a battery in various stages of charge will start to freeze at temperatures indicated below.

Specific Gravity (Corrected to + 80° F.)	Freezing Temperature Degrees Fahrenheit
1.230—¾ charge	-62° F.
1.180	—16° F.
1.130	+ 5° F.
1.080	+19° F.

The above temperatures indicate the approximate points at which the first ice crystals begin to appear in the solution. The solution does not freeze solid until a lower temperature is reached.

A battery three-fourths charged is in no danger of damage from freezing. Therefore keep the battery better than three-fourths charged, *especially during winter weather.*

If your tractor is not to be operated for some time during the winter months, it is advisable to remove the battery and store it in a cool, dry place above freezing (+ 32° F.). Place the battery on a rack or bench.

Check the battery at least once a month for water level and specific gravity. If the battery shows need of charging it should be given immediate attention. Keeping the battery fully charged not only adds to its life but makes it available for instant use when needed.

Continued on next page.

When replacing a battery, make certain that the ground cable is connected to the positive (+) terminal on the battery.

Note: Before working on any part of the electrical system, disconnect the battery ground cable (*See Illust. 47*). Do not reconnect this cable until all electrical work has been completed. This will prevent shorting and causing damage to any of the electrical units.

Valve Clearance Adjustment

Check the valve clearance after every 400 hours of operation and adjust the clearance if necessary. A clearance of .013 inch, measured when the valves are closed and the engine is cold, is necessary between the end of the tappet adjusting screw and the valve stems.

When engine valves are equipped with positive-action valve rotators, check the valve clearance after 50 hours of operation, and after every 150 hours thereafter until the clearance remains the same between two checks.

The loss of valve lash is due to the valve seating without the accompanying build-up of deposits as experienced with standard (non-rotating) valves.

1. To safeguard against accidentally starting the engine when checking the valve clearance, remove cable "B" from the coil cover on the magneto (*see Illust. 41*), or remove distributor-to-coil cable "A" from the socket on the coil of the battery ignition unit. *See Illust. 42.*

2. Remove the valve cover from the left side of the crankcase.

3. Remove the spark plug from the No. 1 cylinder (the cylinder next to the radiator).

4. Place your thumb over the spark plug opening and slowly crank the engine until an outward pressure is felt. (Pressure indicates that the No. 1 piston is moving toward the upper dead center of the compression stroke.) Continue cranking slowly until the "TDC" mark (second notch) on the back flange of the fan drive pulley (on the crankshaft) is in line with the timing pointer in the front crankcase cover. *See Illust. 41A.* Both valves are now closed on the compression stroke of the No. 1 cylinder.

5. Use two thin wrenches when adjusting the valve clearance. *See Illust. 56.* Use the lower wrench to hold the tappet and the upper wrench to raise or lower the tappet adjusting screw. A gauge of .013 inch thickness should slip snugly between the valve stem and the tappet adjusting screw.

Illust. 56

Adjusting and checking valve clearance

6. Crank the engine one-half revolution at a time and check the clearance of each cylinder's valves and adjust if necessary. Do this on each set of cylinder valves in succession according to the firing order of the engine, which is 1, 3, 4, 2.

7. Replace the valve cover. Check to see that the valve cover gasket makes an airtight seal with the crankcase. Replace the gasket if necessary.

8. Replace magneto cable "B" (*Illust. 41*) or distributor-to-coil cable "A" (*Illust. 42*) into the socket from which it was removed.

Important! Be accurate—use a feeler gauge for checking the valve clearance.

Minor Engine Service Operations

Cylinder Head Gasket

For most satisfactory results in tightening the cylinder head after installing a cylinder head gasket, tighten down all nuts fairly snug, starting with the row in the center, then going to the others. Retighten in the same order, giving each nut a small part of a turn at a time. Continue this until all nuts are tight. Do not screw one nut down perfectly tight and then go to the next, as you will not obtain an even pressure on the gasket in this manner.

After replacing the cylinder head, it is necessary to insure against leaks by retightening the stud nuts after engine has been operating and the water jacket has become thoroughly heated.

Crankshaft Bearings, Pistons and Rings

We cannot impress too strongly the necessity of having your International Harvester dealer do the work on replacement of connecting rod bearings, crankshaft bearings, pistons and rings, and grinding valves.

Engine Clutch

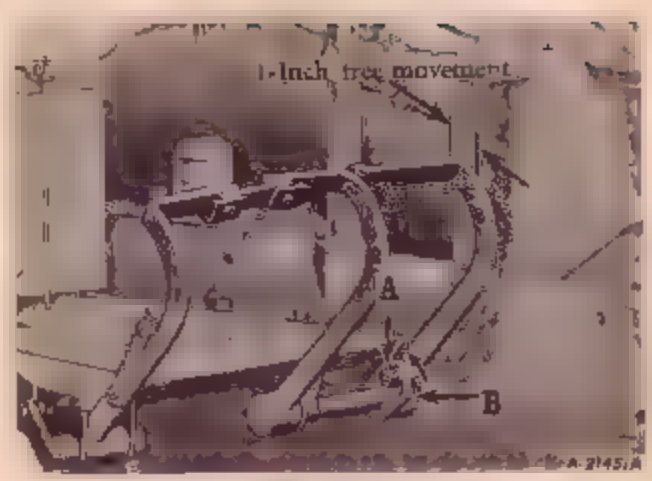
The engine is equipped with either a "Rockford" or "Auburn" clutch, both clutches are of the spring-loaded type, with 6½-inch diameter single plate, and dry disc. You can determine which type is in your tractor by counting the number of pressure springs The "Rockford" clutch has 6 pressure springs while the "Auburn" has 3 springs.

Care of the Engine Clutch

The clutch is so designed that it requires a minimum of attention. Lubricate the clutch release bearing after every 1,000 hours of operation or at least once a year as instructed *in the "Lubrication Guide" on page 29.*

Clutch Clearance

It is very important that the clutch pedal have a free movement of 1 inch (*see Illusts. 57 and 57A*), which will maintain a clearance of ⅛ inch between the clutch release bearing and the clutch release levers. As the clutch wears, this free movement decreases and adjustment should be made. The clutch may be badly damaged unless a free movement of the foot pedal is maintained.

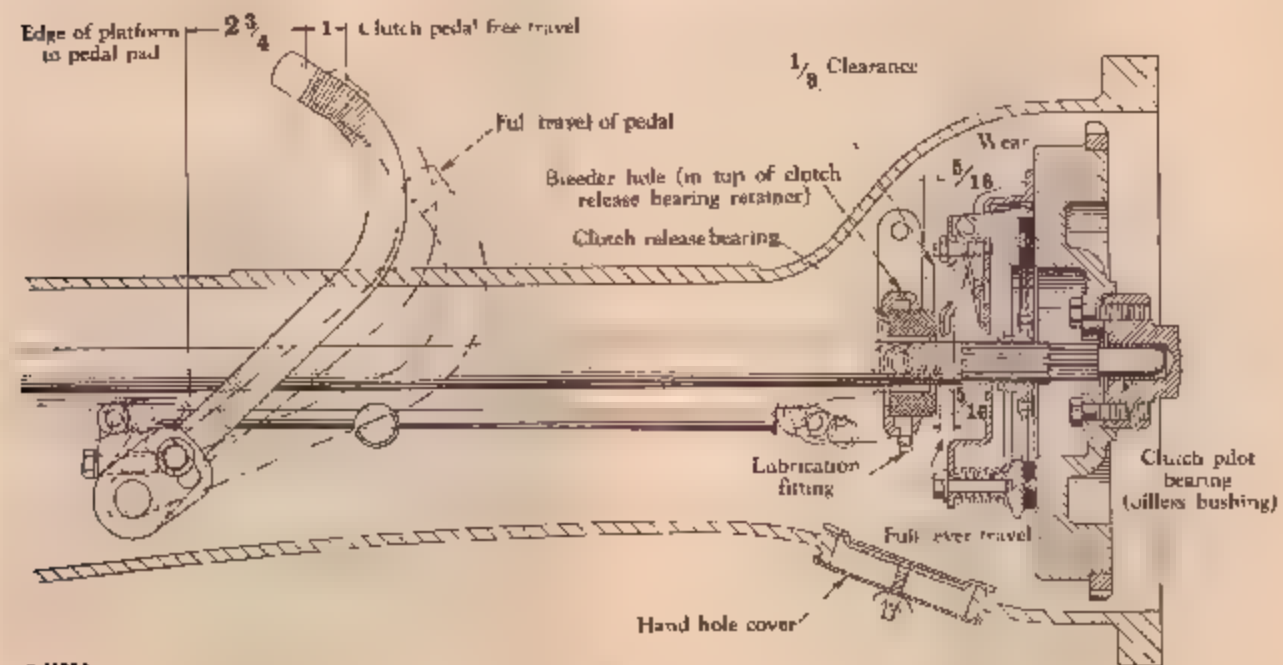


Illust. 57

Clutch pedal adjustment.

The correct free movement can be maintained by loosening cap screw "A" (*Illust. 57*) on the outside of the clutch pedal, and rotating the slotted lever at "B" counterclockwise to a position which will give the 1-inch free pedal travel; then retighten the cap screw

Continued on next page.



Illust. 57A

Clutch and connections.

Brakes

Illust. 58

Brake pedals unlatched to assist in turning

The brakes consist of external bands that contract on drums. The brakes are controlled by foot pedals which can be operated individually or simultaneously when locked together.

Always lock the brake pedals together with latch "A" (*Illust. 58*) when traveling in high gear.

Adjustment

To adjust the brakes, jack up the rear end of the tractor; remove pin "C" and loosen lock nut "D". Turn adjusting yoke "E" until each wheel drags slightly. *See Illusts. 58 and 58A.* Replace pin "C" and tighten lock nut "D" after the adjustment has been completed.

It is very important that both brake pedals have the same amount of free movement to obtain brake

Illust. 58A

Brake pedals latched together and lock engaged to hold tractor in a stationary position

equalization. A definite way to check equalization of brakes is to jack up both rear wheels so they will turn freely. Block the tractor securely and latch the brake pedals together; then start the engine. Operate it either in second or third speed. Application of the brakes should slow down both wheels at the same time and also tend to reduce the speed of the engine. If, when brakes are applied, one wheel stops and the other one continues to revolve, loosen the adjustment on the wheel that stops until both wheels stop simultaneously when the brakes are applied.

Front Wheels

Illust. 58B

Front wheel with disc flange turned in.

Illust. 58C

Front wheel with disc flange turned out

The front wheels are steel disc wheels with drop-base rims for 4.00–12 4-ply tractor-type tires.

Each wheel is mounted on the hub with five special bolts and may be mounted with the disc flange turned in or out to obtain different treads *as described in a subsequent paragraph under "Adjusting."*

The hubs rotate on tapered roller bearings. An oil seal and felt washer are used at the inner end of the hubs.

Adjusting—The front wheels can be adjusted to treads of 43 inches or 49 inches. The wheels are in the 43-inch tread position when the disc flanges are turned in. *See Illust. 58B.* To obtain the 49-inch tread, reverse the wheels on the hubs so that the disc flanges are turned out. *See Illust. 58C.*

Note: The 49 inch tread position is not to be used when the tractor is carrying heavy front end weight.

Check the hub bolts every month or after every 250 hours of operation to make sure that they are kept tightened at 56 minimum to 63 maximum foot-pounds torque.

Rear Wheels

The rear wheels are steel disc wheels with demountable rims for tractor type agricultural tread tires.

Rims—The following rear wheel rims are available:

Rear wheel rim W5-24 for use with 7-24 (4-ply) pneumatic tires.

Rear wheel rim W7-24 for use with 8-24 (4-ply) and 9-24 (4-ply) pneumatic tires.

The W7-24 rims are furnished with the tractor when ordered.

Each wheel is mounted on the axle flange with five special bolts and may be mounted with the disc flange turned in or out to obtain, with the different rim positions, the various wheel treads as described below.

Both front and rear wheels are provided with demounting holes for the addition of cast-iron wheel weights.

Tread adjustment—The rear wheels can be set in five different tread positions of 40, 44, 48, 52 or 56 inches to suit various crop spacings.

The desired tread position can be obtained by reversing the rear wheel discs and by attaching the rims to the discs in different positions *as shown in Illusts. 59, 59A and 60.*

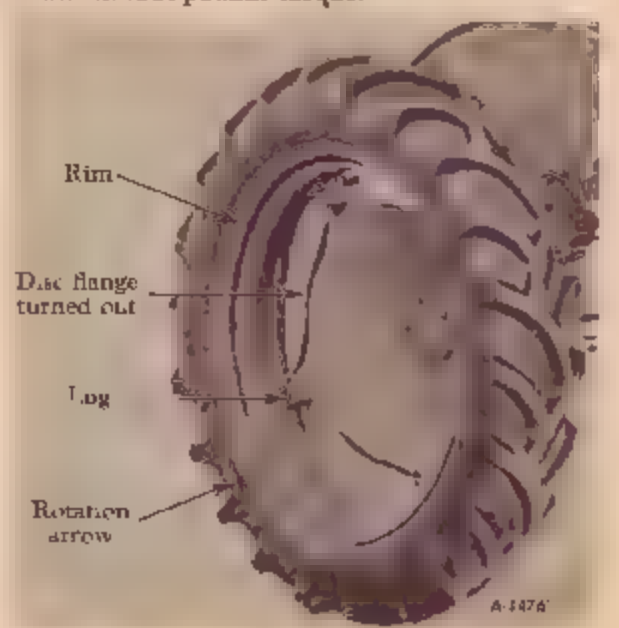
Note: When the rear wheel discs or rims are reversed, make sure that the tire tread will rotate in the correct direction as shown by the arrow on the side of the tires. *See Illusts. 59 and 59A.*

When assembling discs or rims, tighten all bolts securely.

The rear wheel rim bolts and the rear wheel hub bolts should be kept tightened to 85 minimum to 95 maximum foot-pounds torque.

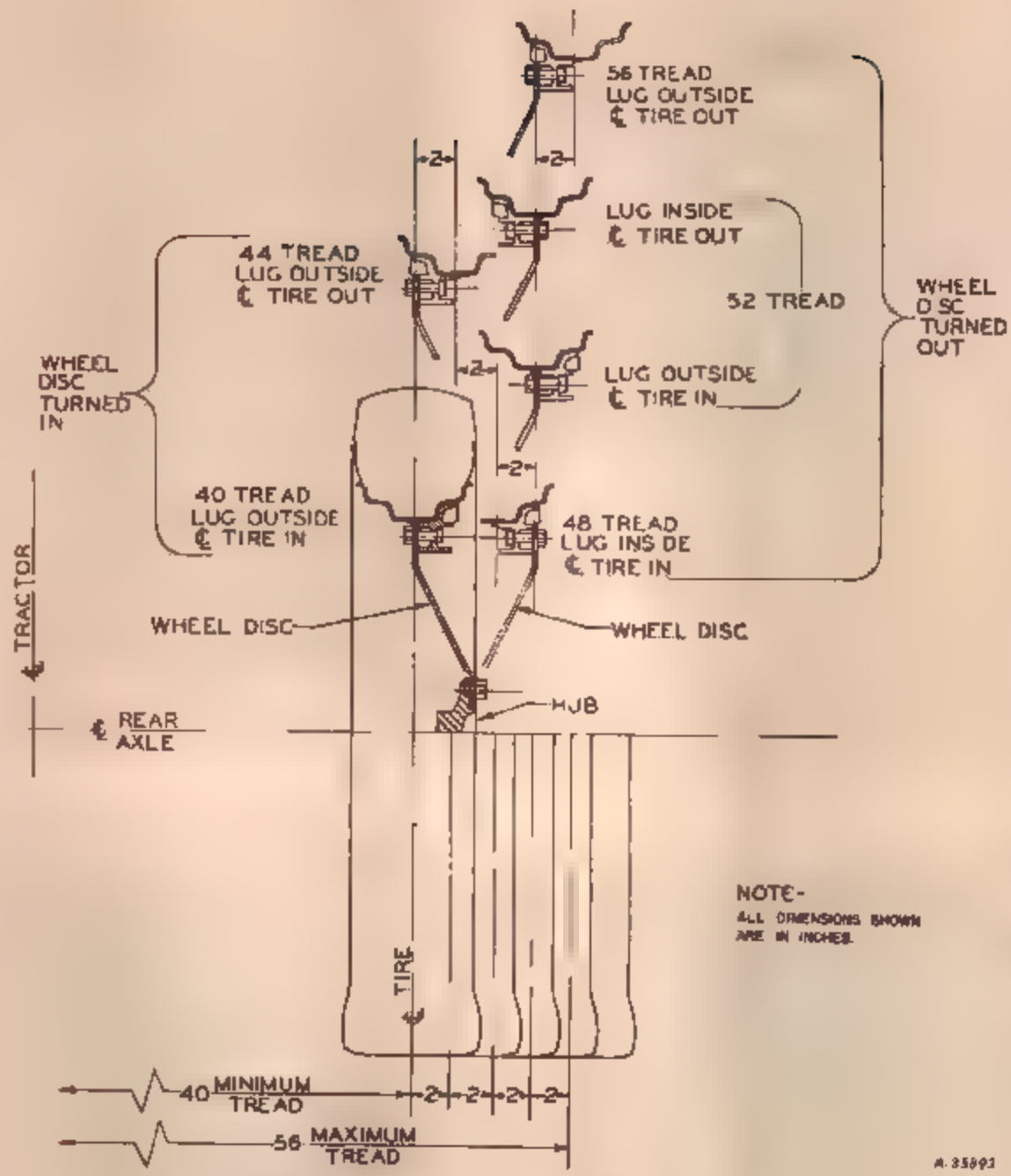
Illust. 59

Rear wheel with disc flange turned in.



Illust. 59A

Rear wheel with disc flange turned out.



Illust. 60

Rear wheel tread positions.

Adjustable Front Axle

If your tractor is equipped with an adjustable front axle, the front wheels can be set at treads of 43, 47, 51, and 55 inches to track with respective rear wheel tread positions.

To Adjust the Tread Widths

1. Raise the front end of the tractor.

2. Loosen the bolts holding axle extension clamps "A."

3. Pull out the cotter pins and remove axle extension clamp pins "B." Remove the bolts from tie rod clamps "C."

4. Pull the axle extensions out an equal distance on both sides to the desired tread position and move tie rods "D" to correspond.

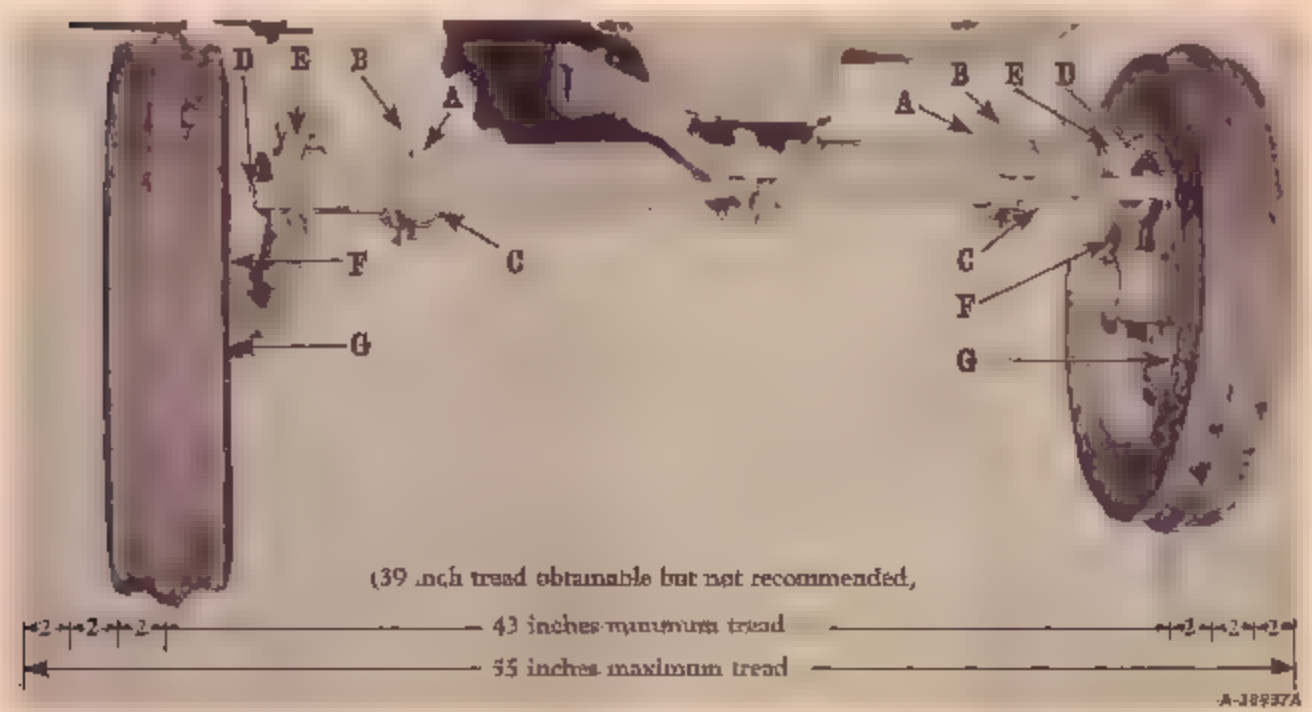
5. Replace axle extension clamp pins "B" in the holes selected and tighten the clamps. Also replace and tighten the bolts in the tie rod clamps.

Note: A minimum front wheel tread of 39 inches is obtainable, but it can be used only on level ground. On rough ground, the right extension can be set at 19½ inches from the center pivot pin, but the left extension must be set at 21½ inches from the center pivot pin to avoid interference between the tire and the steering gear housing when making a left turn.

Front wheels should have ⅛-inch to ¼-inch "toe-in" (⅛ inch closer in front than rear), measurements being taken from the inside of the front wheels at "F" and "G" respectively. *See Illust. 61*

To adjust the "toe-in," disconnect steering knuckle arms "E" at "D," loosen the lock nuts and turn tie rod ends "D" in or out as required.

Be sure to make the arm adjustments equal.



Illust. 61

Adjustable front axle showing variable wheel treads.

Pneumatic Tires

Follow the instructions and recommendations shown below in order to secure maximum life and efficient service from the pneumatic tires.

Inflation

Keep the pneumatic tires properly inflated to the pressures shown in the chart below. Underinflation will damage the tire cord body and may cause the tire to slip on the rim and tear out the tube valve stem. Overinflation results in excessive slippage, causing rapid tire wear.

Check the air pressure once a week with an accurate low-pressure gauge having one-pound graduations. Do not allow the air pressure to drop below the recommendations.

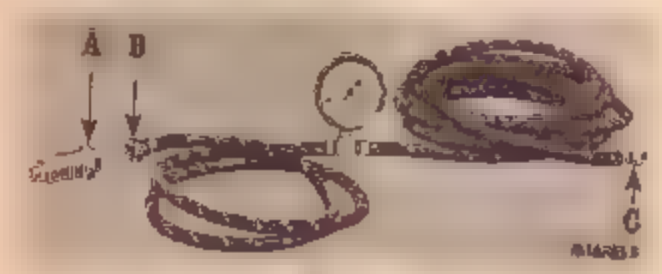
Tires can be inflated with a pressure pump, hand pump, or a spark plug pump. Spark plug pumps can be purchased from International Harvester dealers.

Always see that tire valve caps are in place and screwed tightly. The caps prevent the loss of air through the valve core, and also prevent loose soil, mud, gravel, snow, and ice from entering and damaging the valve core and air chamber in the tires.

Using the Spark Plug Pump

Note: A carbureted engine must be used as the source of power.

Remove one of the spark plugs from the tractor engine, or any carbureted engine having the correct spark plug thread size, and replace with pumping element "A". *See Illust. 62.* Attach one end "B" of the pump hose to the pumping element and other end "C" to the valve stem of the tire to be inflated. Start the engine and run it at low speed for maximum efficiency.



Illust. 62
Tire pump hose and pressure gauge

Operating Pressure for Low-Pressure Tractor Tires

Caution! Adjust air pressure in tires as indicated below immediately upon receiving your tractor.

Front Tire Loads at Various Inflation Pressures

Tire Size	Ply Rating	Pounds per square inch: 20	24	28	32	36	40	44
		Kilograms per square centimeter: 1.40	1.68	1.97	2.25	2.53	2.81	3.09
F-2 Tread								
4.00-12	4	340	365	400	435	465	495	520
I-1 Tread								
4.00-12	6	450	500	550	595	635	675	

Rear Tire Loads at Various Inflation Pressures

Tire Size	Ply Rating	Pounds per square inch: 12	14	16	18	20	22	24
		Kilograms per square centimeter: .84	.98	1.12	1.26	1.40	1.54	1.68
R-1 Tread								
7-24	4	790	865	935	1000	1065	1120	1180
8-24	4	965	1055	1140	1220	1300	1370	
9-24	4	1215	1330	1435	1535			
R-3 Tread								
8-24	4	965	1055	1140	1220	1300	1370	

Tire Code Marking	Tire Industry Type
F-2	Agriculture
R-1	Agriculture
R-3	Industrial
I-1	Rib Implement

Undercoring indicates maximum recommended load

Rear wheel tire loads shown in tables may be increased up to 20% with no increase in inflation when used on tractors with mounted implements and operated at speeds not exceeding 10 miles per hour, tire loads should be calculated to include FULL bins or tanks.

When R-3 tires are used in other than Agricultural Service, use minimum operating pressures of 14 pounds for 12 and 13 inch tires and 16 pounds for 14, 15, 16 and 18-inch tires.

Shipping Tractors Equipped with Pneumatic Tires

When tractors are transported on a carrier, such as railroad cars or trailers, inflation pressures should be as follows to make possible rigid blocking and to prevent bouncing.

Rear tires may be inflated up to 30 pounds pressure. Front tire inflations should not exceed maximum pressures shown in table. This higher pressure must be reduced to operating inflation BEFORE the tractor is removed from the carrier.

Towing

When towing is necessary, use a rope, chain, or cable and have an operator steer the tractor and operate the brakes.

Attach a tow rope, chain, or cable around the front axle and steering gear housing. When towing a tractor, do not exceed a speed of 20 m.p.h.

[illegible]nting Tires on the Rim

[illegible]er mounting a new or old tire on the rim, inflate [illegible] pounds pressure to seat the tire bead on the [illegible]nge and to prevent the tire from creeping and [illegible]ng off the valve. Then deflate or inflate the tire [illegible] correct operating pressure.

[illegible]ection and Weights

The recommended air pressures are shown above [illegible] tractor should not be operated with tires [illegible]operly inflated. To insure maximum hours of [illegible]ce, watch the tread lugs. If they wear down [illegible] fast, immediately add more weight to reduce [illegible]ntage. Check for high air pressure.

[illegible]ee your International Harvester dealer for [illegible]rmation.

Wheel Weights

The drawbar pull of a tractor can be increased by the addition of weight to the driving wheels, either by adding cast-iron weights to the wheels, or by the use of liquid in the tire tube.

The amount of the increase in drawbar pull by the addition of certain definite weights varies with the type of soil. When very heavy weight is required, both liquid and cast-iron weights can be used.

Overloading

Do not load tires beyond their rated capacity. When adding weights, consideration must be given so as not to exceed the load capacity of the tire.

After adding weight to the rear wheel it may be necessary to readjust the height of drawbar to get the correct alignment.

Liquid Weight

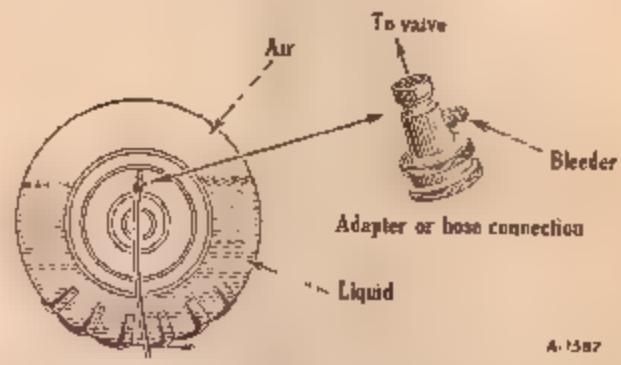
Tractor tire tubes can be filled three-quarters full with liquid, using clean water for temperatures above freezing (+ 32° F.). A calcium chloride solution ($CaCl_2$) is recommended when operating in freezing temperatures.

Methods of Putting Liquid into the Tube

Purchase an adapter (*Illust. 63*) from your International Harvester dealer. The adapter is provided with a bleeder for letting out the air displaced by the liquid.

Jack up the tractor and revolve the tire until the valve stem is on top. Remove the valve core housing and screw on the adapter, then attach a water hose to adapter.

The liquid can be injected into the tube from a tank placed at least five feet higher than the tire, by using a hand force pump or by using compressed air and a pressure tank filled with liquid.



Illust. 63

Tire three-quarters full of liquid

Remove the hose and adapter; then replace the valve core housing, and inflate the tire to the correct operating pressure.

Liquid Weight for Freezing Temperatures

Calcium chloride solution, using a 25% mixture, which is approximately 20 lb. of flaked calcium chloride to 10 U. S. gallons of water, is recommended when freezing temperatures prevail.

The strength of the solution can be checked with a battery hydrometer. A 25% solution measures approximately 1.225 specific gravity and has a freezing point of 25° F. below zero.

Caution! Some calcium chloride flakes have an acid reaction. It is advisable to add 1 pound of lime to each 100 pounds of calcium chloride used.

When preparing calcium chloride solution, always pour the water into the container first; then add the correct amount of calcium chloride crystals, stirring the mixture thoroughly. Never pour the water on the calcium chloride flakes. After the solution is mixed, allow it to cool before using.

Valve Stem Mounting Cones or Nuts

Valve stem mounting cones or nuts are furnished with all rear wheel tire tubes having a valve stem for inserting liquids, and are mounted on the valve stem at the factory.

The purpose of the cone (or nut) is to hold the valve stem in the valve hole when mounting the tire, particularly when liquid is used in the tire. If the tire is mounted or the liquid inserted without the cone (or nut), the valve stem is very apt to be pulled into the rim and will require much extra work to get it through the valve hole.

Care of Tires

Avoid stumps, stones, deep ruts and other hazards. Cuts in tires should be repaired immediately as neglect decreases the tire life

Keep tires free from oil and grease as both destroy rubber.

After using the tractor for spraying—insect control work—wash off with water any chemicals that may be on the tires.

Tire Protection During Storage

When not in use store the tractor so that the tires are protected from the light. Before storing the tractor, clean the tires thoroughly. Jack up the tractor so that the load is off the tires, when it is to be out of service for a long period. If it is not jacked up, inflate the tires at regular intervals. Before putting the tractor in service, always inflate the tires to the correct operating pressures.

Tire Chains

For wet grass or ground conditions, use lug type chains. The flexing of the tire and creeping of chains will break the mud loose as the wheel rotates.

There is a possibility of the tire slipping within the chain: to prevent this, the use of spring-type chain fasteners is recommended.

Static Electricity in Tractors Equipped with Pneumatic Tires Doing Belt Work

Static electricity generated by belt work can be discharged harmlessly by attaching a chain to the tractor and letting it touch the ground

Touch-Control System

The Touch-Control system is ready to operate whenever the engine is running. You will receive the maximum of satisfactory service by closely adhering to the following simple precautions and service operations

The importance of keeping the system free from all dirt, grit and other foreign matter cannot be stressed too strongly. Keep the IH Touch-Control fluid reservoir, pipe lines and pump as clean as possible at all times. As an added precaution against the entry of dirt into the system, the reservoir is constructed without an air vent. Sufficient air space is allowed above the fluid level to compensate for the pressure changes occurring during the operation of the system. As a result a small amount of pressure may be found in the reservoir upon removing the filler plug when checking the fluid level

Fluid Level

When the Touch-Control system is filled to the proper level with IH Touch-Control fluid, it should not require servicing, unless for some reason the system has been disturbed

The correct fluid level is to the bottom of the filler opening. If it is necessary to add fluid, use IH Touch-Control fluid. It is essential that the fluid be absolutely clean and free from water and all foreign matter when placed in the system. Cloudiness may indicate the presence of moisture.

If the Touch-Control system should fail to operate in a satisfactory manner check to see if there are any noticeable leaks in the system, also check the fluid level in the reservoir, or see your International Harvester dealer.

Never operate the tractor without having sufficient fluid in the reservoir. Insufficient fluid may cause damage to the Touch-Control system.

Before removing the filler plug (*Illust. 17*) for inspection, thoroughly clean the plug and surrounding area of all dirt and grit.

Draining and Filling the Reservoir

When it is necessary to drain and refill the reservoir for any reason, proceed as follows:

1. Wipe off all dirt and grit from the reservoir and filler plug.

2. Remove the filler plug (*Illust. 17*) and the drain plug (*Illust. 65*) and place them in a clean container

When the fluid has stopped draining, run the engine very briefly to drain the fluid from the pump and connecting pipes.

The refill capacity of the Touch-Control system when drained as instructed above is 3½ pints

Draining and Filling the Reservoir—Continued

Note: If it is necessary to flush the system, use IH Touch-Control fluid so that the necessary lubrication of the pump and control system is maintained without adulteration. Never use kerosene or any other oil.

3. After the system has drained completely replace the drain plug and fill the reservoir to the filler opening with IH Touch-Control fluid.

4. Start the tractor engine and operate it at a moderate idle speed. With the filler plug removed, move the Touch-Control lever back and forth 10 to 12 times through its full range of travel. This quickly frees the system of trapped air. Then place the control lever in the rearward position (toward tractor seat) and stop the engine.

5. Add sufficient clean fluid to the reservoir to bring the fluid level to the bottom of the filler opening. Replace and tighten the filler plug.

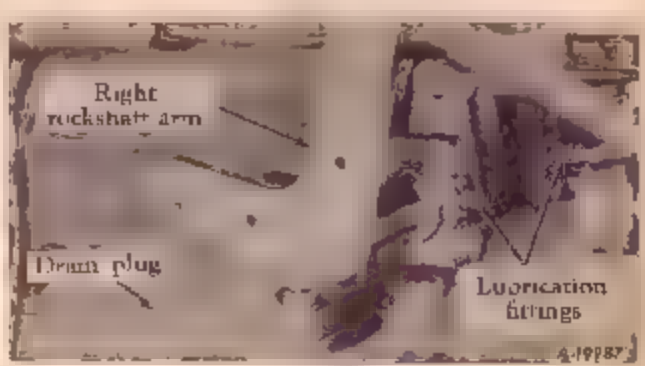
The refill capacity for the Touch-Control system when drained *as instructed in paragraph 2* is 3½ pints.

The capacity of a completely dry unit (when a new or rebuilt unit is installed) is 4¾ pints.

Lubrication

Daily or after every 10 hours of operation, lubricate the rockshaft arm and bearings through lubricator fittings. *See Illust. 65.* Use pressure-gun grease (chassis lubricant) and apply 2 or 3 strokes of lubricator, or sufficient grease to flush out the old grease and dirt.

Note: Always keep the Touch-Control lever in the rearward position (toward tractor seat) when the tractor or the Touch-Control system is not being actively used. This places the piston in the retracted position, preventing exposure to any moisture which may have condensed in the leather dust boot.



Illust. 65
Showing lubrication points

Air in the System

Make certain that all connections and openings are well sealed. The entire system must be kept tightly sealed at all times, not only to prevent loss of fluid but also to avoid entrance of air in the inlet end of the system. Air entering the system interferes with proper lubrication of moving parts. It causes an increased amount of vibration and an unsteady pressure. Presence of air in the system will be noticed by a noise in the pump or by the pump laboring when operating under high pressure. Proper filling of the reservoir and working the system during the filling process, as previously described, will work the air out of the system.

Trouble Shooting

Possible Cause	Possible Remedy
Hard to Start	
No gasoline in fuel tank or carburetor	Fill the tank with new gasoline; open the fuel shut-off valve. Check the fuel lines, fuel strainer and carburetor.
Gasoline strainer or fuel lines clogged	Clean the fuel strainer, fuel lines and carburetor
Impulse coupling inoperative (tractors with magneto)	Flush with kerosene; *refer to page 40.*
Water in gasoline	Drain the fuel tank and carburetor. Use new fuel and dry the spark plugs.*
Water in cylinders	Check the cylinder head gasket or look for a clogged drain hole in the exhaust manifold
Choked improperly. Flooded engine	Follow the starting instructions. *See page 8.*
Defective ignition or loose wiring	Check the wiring, plugs, magneto, battery ignition unit, etc., *see pages 38 to 45.*
Defective battery or cranking motor	Check and service, *see pages 49 and 54,* or replace.
Spark plugs dirty or improper gap	Clean; adjust the gaps to .023 inch, or replace the plugs.
Magneto grounded (tractors with magneto)	Pull out on the ignition switch. Check for other possible grounds, also *see "Magneto" on page 39.*
Engine speed control not advanced	Advance the lever one-third for starting.
Lack of compression	*
Flywheel ring gear teeth broken	*
Too heavy grade of lubricating oil	Drain and refill with proper lubricant. See the lubricant specifications *on page 24.*
Gears engaged	Put the gearshift in the neutral position
Internal seizure	*
Engine Operates Irregularly or Knocks	
Engine incorrectly timed	Retime. *See pages 40 and 41 or pages 44 and 45.*
Spark plugs dirty; wrong gap or wrong type	Clean, reset the gaps to .023 inch or replace.
Poor or weak spark	Check the magneto or battery ignition unit if the spark is good from the coil. Check the distributor points and opening, spark plugs, and wiring; *see page 38 or 43.*
Carburetor setting incorrect	Adjust; *see "Carburetor" on page 31.*
Poor grade fuel or water in fuel	Drain and use a good grade of clean fuel.
Engine overheating	Check the cooling system and fan belt; *see "Engine Overheats" on page 67*
Engine valves at fault	Check the valve clearance *
Air leaks around intake manifold	Check the gasket and tighten the nuts.
Engine smokes	Check the air cleaner oil level. Check the fuel delivery at the carburetor. Check for worn pistons and rings *
Excessive carbon in engine	*
Loose piston pin or bearings	*
Broken rings or loose pistons	*
Worn connecting rod and main bearings	*
Governor sticking or needs adjustment	*
Lack of Power	
Engine speed control lever not advanced	Advance the engine speed control lever
Engine cold or overheated	Run the engine until it warms up before putting it under load. Check the cooling system.*
Engine overloaded	Reduce the load
Engine knocks excessively	Use good fuel, also check the timing.*

** See your International Harvester dealer.*

Possible Cause	Possible Remedy
Governor not working properly	*
Poor compression	Service the valves and piston rings *
Poor fuel or too lean a mixture	*See "Carburetor" on page 31.*
Fuel lines or strainer obstructed	Clean. *See page 32.*
Fuel tank air vent closed	Open the vent in the cap
Exhaust pipe clogged	Clean out
Air cleaner clogged or air leakage between carburetor and engine	Clean the air cleaner as instructed *on page 37.* Tighten the carburetor and manifold mounting nuts.
Oil of too high viscosity in crankcase or air cleaner	Drain and refill with proper lubricant. See the lubricant specifications *on page 24.*
Incorrect timing or faulty ignition	*See "Magneto" (page 40) or "Battery Ignition Unit" (pages 44 and 45).*
Clutch slipping	Adjust the pedal free travel (*page 57*).*
Brakes drag	Adjust the brakes, *see page 58.*
Carburetor intake manifold or cylinder head intake ports restricted by carbon	Clean.*

Engine Overheats

Cooling system clogged or limed	Clean the system; *see page 35.**
Fan belt slipping	Adjust or replace the belt: *see page 36.*
Insufficient water in cooling system	Fill the radiator to the proper level; *see page 34.*
Radiator cores clogged	Remove all chaff or dirt from the radiator grille; clean with a hose if available
Wrong kind of fuel	Change to a good grade of gasoline.
Carburetor improperly set	*See "Carburetor" on page 31.*
Timing incorrect	*See "Magneto" on page 40 or "Battery Ignition Unit" on pages 44 and 45*
Breaker point opening incorrect	Adjust the opening, *see "Magneto" on page 40 or "Battery Ignition Unit" on pages 44 and 45.*
Excess load	Reduce the load
Excess carbon in engine	*

No Oil Pressure, Too High or Too Low

Defective oil gauge	Replace.*
Wrong grade, diluted or insufficient oil	See the lubricant specifications *on page 24.* Check the oil level, if diluted, replace with fresh oil, see the operating instructions.
Broken, loose or plugged oil lines	Clean and tighten.*
Low oil level in crankcase	Add oil, refer to *"Lubrication Guide."* Check for an oil leak
Defective or dirty oil pressure regulating valve	*
Oil pump strainer clogged or pump not working	Clean as instructed *on page 21.**
Worn bearings	*

Oil Dilution or Uses Too Much Oil

Incorrect oil viscosity	Refer to the lubricant specifications *on page 24.*
Leaks in oil lines or filter, or oil pan plug or gasket	Check and tighten *
Worn piston or oil rings	*
Loose connecting rod bearings	*
Long engine idling	Stop the engine.
Engine overheating or too cold	*Refer to "Lack of Power" and "Engine Overheats" on pages 66 and 67*
Engine speed too high	*
Crankcase breather clogged	Clean the screen in top of the oil level gauge, *see page 21*

**See your International Harvester dealer*

Possible Cause	Possible Remedy
Using Too Much Fuel	
Fuel mixture too rich. Carburetor out of adjustment	Check the choke *and see "Carburetor" on page 31*
Fuel leaks	Tighten or replace the fuel lines or fuel strainer gasket.
Poor grade of fuel.	Use a good grade of gasoline
Choke closed	Investigate for the choke not operating
Engine overloaded	Reduce the load or shift to a lower speed
Poor compression.	*
Faulty ignition	*See pages 38 to 56.*
Engine not operating at proper temperature	Check the cooling system. Check the lubricating oil.*
Air cleaner clogged.	Service the air cleaner; *see page 37.*
Incorrect viscosity or amount of lubricating oil	Refer to the lubricant specifications *on page 24*, keep the oil up to the proper level.
No Fuel at Carburetor	
Fuel low in tank	Fill the fuel tank and check the fuel lines.
Air vent hole in fuel tank cap plugged up.	Clean out the vent hole
Fuel valve closed or partly open	Open the valve; see the starting instructions *on page 8.*
Dirty or clogged fuel strainer screen or line	Clean as instructed *on page 32.*
Ignition and Electrical	
Wrong kind, old, cracked, dirty, or poorly set spark plugs	Clean and set the gaps to .023 inch, or replace with new ones
Loose wiring or improper connections	Check the wiring to see that all connections are clean and tight. *See pages 38 to 56.*
Magneto or battery ignition unit not timed correctly	Retime as instructed *on pages 40 or 44 and 45.*
Distributor cap or rotor or breaker chamber dirty	Clean as instructed *on pages 39 and 40 or 43*
Distributor brush broken	Replace the brush.*
Breaker points dirty, pitted or improperly set	Clean and reset the opening or replace with new points *See pages 39 and 40 or 43.*
Breaker arm stuck, weak or broken spring	Check and replace. *See page 39 or 43*
Impulse coupling dirty (tractors with magneto)	Clean and lubricate as instructed *on page 40.*
Battery defective, low charge or loose connections	Recharge; clean and tighten the cable lugs or replace with new ones, check the ground cable; *see pages 54 to 56*
Cranking motor failure	Replace.*
Generator inoperative	Clean the commutator; check the brushes (*page 49 or 53*).*
Generator relay or voltage regulator	*
Charge indicator inoperative.	Replace the charge indicator.*
Lights will not burn.	Check the battery ground cable. Turn on the switch, replace the sealed beam units or fuse, recharge the battery, check the wiring and generator.*
Lights burn dim	Turn the switch to bright. Recharge the battery, tighten the cable terminals, check the sealed beam units, clean the contacts
Brakes	
Do not hold.	Adjust the brakes (*page 58*) or a new lining is needed.*
Drag or uneven	Adjust the brakes. *See page 58.*
Grease on lining	Replace the lining.*
Return spring broken	Replace
Do not release	Release the brake lock. Be sure that the left brake cross shaft is free to turn.

* *See your International Harvester dealer.*

Possible Cause	Possible Remedy

Transmission, Belt Pulley and Power Take-Off

Hard to shift gears	Use lubricant of the correct viscosity. *See page 24.*
Shifter fork or lever defective	Replace.*
Engine clutch drags	*See "Lack of Power."*
Gears clashing	Stop the tractor and disengage the clutch before shifting the gears.
Gears slipping out of mesh	*
Noisy	Check the oil level, use lubricant of the proper viscosity *
Damaged parts	*

Rear Wheels

Do not turn	Release the brake lock. The transmission, differential or clutch is faulty. *Refer to "Transmission, Belt Pulley and Power Take-Off"* *

Front Wheels

Too tight or too loose	Check the lubricant in the bearings; check the bearing adjustment, *see page 23*
Lubricant leakage	Check the oil seal *

Steering

Faulty	Check the steering worm and gear, check the front axle adjustment. *See page 61.* Check the lubricant in the front wheel. Check the tire inflation.*
Defective front axle	Inspect the linkage; check and replace faulty parts.*
Tractor turns to one side	Check and adjust the brakes evenly. *See page 58.* Check the pneumatic tire air pressures. Check the front axle adjustment, *see pages 61 and 62.*

Pneumatic Tires

Excessive or uneven wear	Check the toe-in. *See page 61.* Check the air pressure and check the load on tires. *See page 62.*
Slippage, rear tires	Add more weight, and check for high pressure. *See page 61.* If the tread is badly worn, the tires may slip more readily. Replace with new tires or use lug-type chains.

Fast-Hitch System

See detailed instructions *on pages 18, 19 and 20.*

Farmall Touch Control System

See detailed instructions *on pages 16, 17, 64 and 65.**

* *See your International Harvester dealer.*

Storing and Housing Your Tractor

When your tractor is not to be used for a period of time, it should be stored in a dry and protected place. Leaving your tractor outdoors, exposed to the elements, will materially shorten its life.

Follow the procedure outlined below when your tractor is placed in storage, and repeat the lubrication precautions every six months thereafter. We also recommend caution to be practiced in starting an engine that has been in storage.

1. Wash or clean and completely lubricate the tractor (*refer to "Lubrication Guide"*).

2. Drain and flush the cooling system.

3. **Tractors with magneto:** Oil the magneto impulse coupling liberally with kerosene.

4. After the engine has cooled off, remove the spark plugs and pour one tablespoon of SAE-50 lubricating oil of good quality into each cylinder. Crank the engine two or three times to distribute oil over the cylinder walls.

5. Remove valve cover; flush valves and push rods with SAE-50 oil. Use a paint brush to coat the inside of the valve housing cover with SAE-50 lubricating oil. (If any evidence of rust is found, remove it before lubricating.) Replace the valve cover.

6. Remove the oil filter element. (If any evidence of rust is found on the retaining bolt, clean it thoroughly.) Replace the old filter element with a new one and flush out any sludge from the filter base as instructed on *page 22*.

7. Drain the fuel from the fuel tank and carburetor, and clean out the fuel strainer glass bowl.

Caution! Gum will eventually form in tanks, lines and carburetor if unit is not used. Gum in carburetor jets and passages affects engine starting. Gum can be dissolved with acetone or a 50-50 mixture of alcohol and benzol.

8. If the tractor is equipped with a storage battery, remove the battery and place it on a rack in a cool room and check the battery at least once a month for water level and specific gravity. *See pages 54 and 55.*

9. Block the clutch pedal with a wood block so that the clutch is disengaged. This will prevent the clutch facing from sticking to the flywheel or clutch pressure plate.

Starting Engines That Have Been in Storage

1. Remove the spark plugs and pour a mixture of one-half gasoline and one-half light lubricating oil into each cylinder (two tablespoonfuls per cylinder is enough).

2. Remove the valve cover, and flush the valve and valve operating mechanism with the same mixture.

3. Crank the engine rapidly until excess oil has been blown out of the spark plug holes. This operation will loosen any tight piston rings and wash old gummy oil from valves and pistons.

4. **Tractors with magneto:** Flush out the impulse coupling with kerosene and lubricate as specified.

5. Drain the crankcase and flush out with kerosene or flushing oil and fill with the specified lubricating oil. *See "Lubrication Guide" and page 24.*

6. Be sure the lubricating oil filter has a new element before starting the engine.

7. Install the spark plugs after cleaning and setting gaps.

8. Fill the water cooling system.

9. Fill the fuel tank.

10. Install a fully charged battery (if used) and be sure the proper connections are made.

11. Clean the air cleaner and refill the oil cup.

12. Start the engine and let it run slowly; observe if any valves are sticking. If so, pour a small quantity of kerosene on the valve stem until loose.

13. Assemble the valve cover.

Caution! Do not accelerate the engine rapidly or operate it at high speed immediately after starting. Also, keep the doors wide open or move the tractor outside the storage room immediately to avoid danger from exhaust gas.

14. After the engine has been run long enough to clean any excess oil out of the cylinders, the spark plugs should be removed and checked for oil fouling. If fouled, clean and reinstall them in the engine.

15. Remove the block from the clutch pedal.

EXTRA EQUIPMENT AND ACCESSORIES

The tractor is used for so many different types of work and is called on to operate under so many different conditions that a considerable variety of equipment is necessary to adapt it to the varied requirements of the user.

When you purchased your tractor, you probably had it completely equipped for your particular needs at that time. However, later you may wish to obtain some of the equipment or accessories shown and described in the following pages. These items can be purchased from and installed by your International Harvester dealer

Adjustable Front Axle

Opt. 71

Adjustable front axle

The adjustable front axle replaces the regular, fixed front axle. The variable treads of 43, 47, 51 and 55 inches permit adjustment to fit most any row crop ranging from narrow rows of vegetables to wide rows such as cotton and corn

For instructions on adjusting the tread widths, *see page 61*

High Altitude Cylinder Head

The high altitude cylinder head consisting of a new cylinder head, cylinder head gasket and water outlet elbow gasket, is available to give improved engine performance at high altitudes

See your International Harvester dealer

Valve Rotators

Valve rotators will add many full-power hours to the engine life of your tractor Rotators give valves a positive turning motion that reduces burning by keeping seats and stems clean, thereby assuring proper seating and preventing overheating. The installation of these rotators will increase the life of the valves, and reduce maintenance costs The rotators will help assure top performance of your tractor at all times.

Pressure Radiator Cap

A pressure-type radiator cap is available from your International Harvester dealer It will overcome loss of water caused by spillage when operating over rough terrain or during high atmospheric temperatures under extremely heavy load conditions

Electric Starting and Lighting

Electric starting is more than a mere convenience to the tractor operator; it eliminates the hand-cranking problem for smaller members of the family who are otherwise entirely competent operators, and is also a fuel saver. It removes the temptation to idle the engine during "times out" to avoid using the hand crank when work is resumed.

The headlights and rear light greatly extend tractor usefulness. With strong, steady, electric light the tractor can be used after dark and, if necessary, all night, to make up for time lost because of bad weather. It can be used at night to take quick advantage of favorable weather and soil conditions, or to prevent loss of crops overdue for harvest.

See pages 46 to 56 for operating and maintenance instructions.

Combination Rear Light and Tail Light

Illust. 72

Combination rear light and tail light.

The combination rear light and taillight is interchangeable with the regular rear light and contains both a white and a red lamp for field and highway operation respectively.

A switch, located on top of the body, enables the operator to select the proper light.

Break-Away Connector Socket

A break-away electric socket and mounting bracket is available to be assembled on the bolt through the rear platform and rear axle housing.

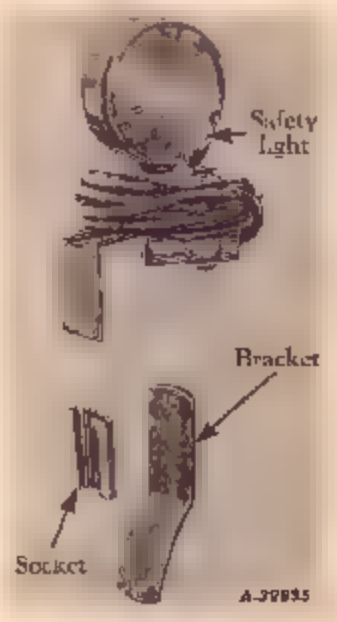
This socket serves as a plug-in connection for the safety light on the tractor or trailing implements. It can also be used to plug in a battery charger or trouble light.

Illust. 72A

Break-away connector socket and mounting bracket.

Safety Light (6 Volt)

A safety light with mounting parts is available for use on the tractor or trail behind implements when transported on a highway at night. The safety light has an "Amber" glass to the front and "Red" glass to the rear and is equipped with 22 feet of cord with a break-away connection plug. The safety light is turned on by inserting the plug in the break-away connector socket. If your tractor is not equipped with a break-away connector socket, it must be ordered separately.



Illust. 72B

Safety light and mounting parts.

De Luxe Upholstered Seat

Illust. 73
Upholstered seat

The de luxe upholsvered seat is used to replace the regular seat when additional riding comfort is desired. It consists of foam rubber padding covered with Silver Shade "Koroseal" upholstery which has excellent water repellent and wear resisting qualities

Since the Silver Shade finish has a tendency to reflect rather than absorb the sun's rays, the seat will remain cooler, thereby adding to the operator's comfort for hot weather operation.

Detachable Seat Pads

Illust. 73A
Detachable seat pad.

Two types of detachable seat pads are available to re-cover the regular seat or the de luxe upholstered seat. One seat pad is filled with jute felt padding while the de luxe seat pad contains a foam rubber filler. Both pads have Silver Shade "Koroseal" upholstery The seat pads are quickly and easily fastened to the seat with drawstrings after the old upholstery has been removed

De Luxe Cushion Seat

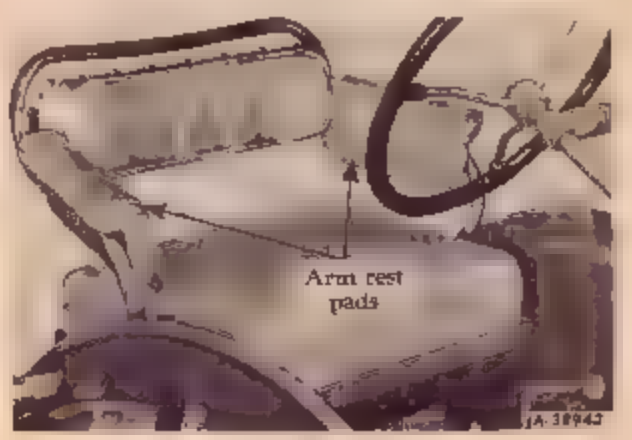
The deluxe cushion seat is used to replace the regular seat to provide the maximum in riding comfort It consists of a back rest and seat cushion with foam rubber padding covered with Silver Shade "Koroseal" upholstery which has excellent water-repellant and wear resisting qualities. *See Illust.* 73B

Illust 73B
DeLuxe cushion seat

Since the Silver Shade finish has a tendency to reflect rather than absorb the sun's rays, the seat and and back rest will remain cooler, thereby adding to the operator's comfort for hot weather protection.

Arm Rest Pads

Arm rest pads are available for the arms of the deluxe cushion seat. They also have foam rubber padding and Silver Shade "Koroseal" upholstery to match the deluxe cushion seat. The arm rest pads are quickly and easily attached to the arms by spring plates. *See Illust.* 73C.



Illust. 73C
Arm rest pads on deluxe cushion seat.

Belt Pulley and Power Take-Off

The power take-off, mounted on the back of the transmission case, extends the power of the engine to the rear of the tractor for operating the mower mechanism or the mechanism of other power-driven implements that will fit the International Cub Lo-Boy Tractor. The power take-off shaft projects through the rear of the differential housing and is driven by the transmission drive shaft. The power take-off shifter lever engages and disengages the power take-off shaft from the transmission drive shaft; the engine clutch should always be disengaged before moving this shifter lever. The power take-off has a speed of 1,800 r.p.m.

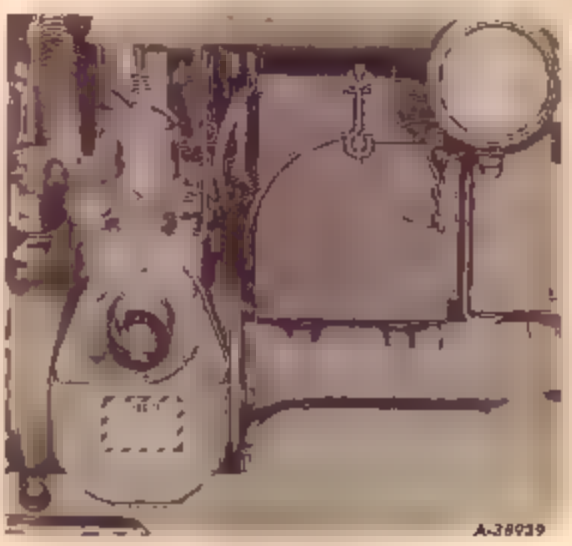
The belt pulley, mounted on the power take-off, increases International Cub Lo-Boy utility by making the power of the tractor engine available for the operation of belt-driven machines such as corn shellers, feed grinders and hammer mills. The belt pulley is driven by the power take-off shaft.

The belt pulley shaft speed is 1,487 r.p.m. under full load. The low idle speed is 392 r.p.m. and the fast idle speed is 1,665 r.p.m., no load.

Several different sizes of pulleys are available for use with the belt pulley. They must be ordered separately to suit your requirements. See "Belt Pulley Specifications" in the next column.

The belt pulley and power take-off is available as a unit or the power take-off is available separately. The belt pulley is also supplied separately for tractors that are already equipped with a power take-off.

The instructions for operating the belt pulley and power take-off are *on pages 12 to 14*. For lubrication *see pages 27 and 29*.



Illust. 74A

Power take-off assembled on tractor

Static electricity, generated by belt work in tractors equipped with pneumatic tires, can be discharged harmlessly by attaching a chain to the tractor and letting it touch the ground.

Illust. 74

Belt pulley and power take-off assembled on tractor

Belt Pulley Specifications

Diameter (Inches)	Face Width (Inches)	Pulley Speed (R.P.M.)	Belt Speed (Feet per Minute)
7⅝	4¼	1,487	2,968
9	4¼	1,487	3,504
6	4¼	1,487	2,336

Touch-Control

Touch-Control provides hydraulic power with convenient fingertip control for raising, lowering and adjusting the working depth of various implements used with the tractor.

Implements can be regulated and adjusted without stopping work while the tractor is in motion or while standing still. *See pages 16, 17, 64 and 65 for further information.*

Fast-Hitch

The Fast-Hitch provides an easy, simplified means of attaching and detaching rear mounted implements and also adds to the flexibility afforded by the Touch-Control system. Coupling, uncoupling, depth control and leveling of implements all can be done from the tractor seat. *See pages 18 to 20 for further information.*

Pull Bar Extension

A pull bar extension is available for pulling trailing implements. When in use, the extension is attached to the pull bar with the hitch hole toward the rear by a pivot pin and quick attachable cotter pin. When not in use, the pull bar extension should be turned with the hitch hole toward the front. *See Illust. 19.*

Cushion Spring

Illust. 75
Cushion spring

A cushion spring (*Illust. 75*) is available for use on the pull bar in place of the pull bar extension straps when conditions require additional protection against damage to the tractor, hitch, or implement should a hidden obstruction be encountered in the field.

Pneumatic Tire Pumps

Enginair or Schrader

These tire pumps are useful where air service is not easily obtained. They may be used for inflating tractor, truck, or automobile tires.

Note: These tire pumps may be used with any carbureted-type engine, but they cannot be used on diesel engines, a carbureted engine of another unit must be used as the source of power. The tire pumps also are available for various spark plug thread sizes. Specify the size of spark plug thread when ordering.

Illust. 75A
Tire pump, hose, and pressure gauge

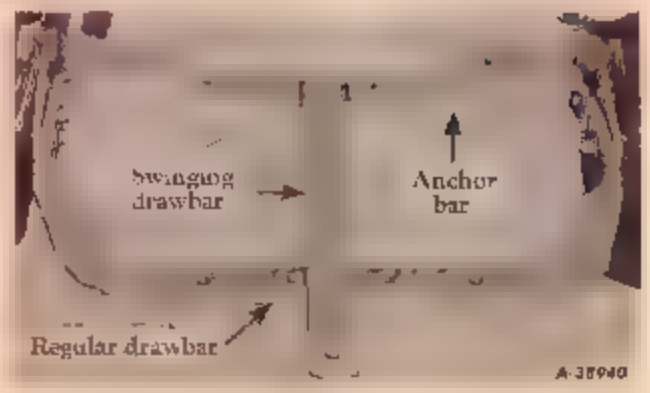
Schrader spark plug tire pump kit. This kit consists of items which are necessary for proper care of the tire valve and maintenance of proper air pressure. With this kit you can maintain tire pressure on all tractors, trucks and passenger cars by changing adapters on the tire pump to suit the spark plug thread size.

The following items are packed in a serviceable metal box.

- One tire pump with 16 feet of hose and an air gauge for registering pressure up to 100 pounds.
- Five adapters for spark plug thread sizes 10 mm., 14 mm., 18 mm., 7/8 18 and 1/2 inch.
- Five valve cores and five valve caps which fit all standard tire valves (packed in small metal boxes).
- One valve repair tool and one valve fishing tool.
- One air-water tire valve and one air-water adapter.
- One tire pressure gauge for air-water tractor tires.

Swinging Drawbar

(Tractors without Fast-Hitch)



Illust. 76
Swinging drawbar assembled on tractor

The swinging drawbar is free to swing the full width of the regular drawbar, making it easier to turn the tractor under load when pulling trail behind implements such as disk harrows. It also facilitates steering on the straightaway when the tractor is pulling a heavy load. The load exerts less sidewise pull on the tractor and therefore interferes less with steering. This drawbar is especially desirable when working in small, irregularly shaped fields.

Front Wheel Weights

The front wheel weights weigh approximately 26 pounds each, and either one or two can be attached to each front wheel. To increase steerability, front wheel weights are recommended for use as a front end counterbalance whenever heavy loads are superimposed on the drawbar, or when heavy equipment is to be mounted on the rear end of the tractor

The first set of front wheel weights includes a set of two weights and four ½ NC x 1¾-inch bolts, nuts and lock washers for attaching the weights to the front wheels at "A" (*Illust. 76A*).

If additional weight is desired a second set of weights can be attached to the first weights by using four ½ NC x 3⅜-inch bolts, nuts and lock washers at 'B' (*Illust. 76B*).

Illust. 76A
First front wheel weight mounted on wheel

Illust. 76B
First and second front wheel weight mounted on wheel

Rear Wheel Weights

The rear wheel weights weigh approximately 150 pounds each and either one or two can be attached to each rear wheel to reduce slippage and tire wear and increase traction of rubber tired tractors.

The first set of rear wheel weights includes a set of two weights and eight ½ NC x 3-inch bolts, nuts and lock washers for attaching the weights to the rear wheels at "A" (*Illust. 77*).

If additional weight is desired a second set of weights can be attached to the first weights by using four ½ NC x 6¼-inch bolts, nuts and lock washers at "B" (*Illust. 77A*).

Before attaching the second rear wheel weights, it is necessary to remove two bolts from each first weight and replace them with the longer bolts provided with the second weights.

If the second weights are removed, replace the two shorter bolts in each first weight.

Illust. 77

First rear wheel weight mounted on wheel.

Illust. 77A

First and second rear wheel weights mounted on wheel.

SPECIFICATIONS

Capacities (Approximate—U.S. Measure)

Fuel tank	7½ gal
Water cooling system	[illegible] qt
Crankcase pan	3 qt
Transmission case	[illegible] pt
Rear axle drive housing (each)	[illegible] pt
Steering gear housing	[illegible] pt
Air cleaner oil cup (Donaldson)	½ pt
Air cleaner oil cup (United)	[illegible] pt
Belt pulley housing	[illegible] pt
Touch-Control system	[illegible] pt

Engine

Cylinders	4
Bore	2⅝ in.
Stroke	2 in.
Engine speed (governed)	
Minimum no load speed	450-500 r.p.m.
Maximum no load speed	2,016 r.p.m.
Maximum (full load)	1,800 r.p.m.
Magneto (counterclockwise rotation)	IH, Type J-4
Spark plug gap	.023 in.
Valve clearance (engine cold)	.013 in.
Carburetor	IH, [illegible] in. updraft
Battery ignition unit (when so equipped) (clockwise rotation 15° advance)	IH

Clutch

Single-plate, dry-disc, spring-loaded	[illegible]

Belt Pulley and Power Take-Off

Pulley speed	
Low idle (no load)	442 r.p.m.
Fast idle (no load)	665 r.p.m.
Maximum (full load)	1,487 r.p.m.
Belt speed (with 7 in. pulley) (at 1,487 r.p.m. pulley speed)	2,968 ft. per min.
Pulley diameter	7⅝ in.
Pulley face	4¾ in.
Power take-off shaft speed (counterclockwise rotation)	
Low idle (no load)	475 r.p.m.
Fast idle (no load)	2,015 r.p.m.
Maximum (full load)	1,800 r.p.m.

Fuse and Headlights or Rear Light

Fuse (cartridge-type) (106 653)	SFE—20 amp.
Headlight or rear light sealed beam unit (358 890 R91)	6-8 volt

Foot Brakes

External contracting on drums.

SPECIFICATIONS

Transmission (three speeds)

(Speeds based on 8—24 pneumatic tire size.)

Speed (miles per hour):	1st	2.4
	2nd	3.2
	3rd	7.3
	Reverse	2.

Wheels and Tread

Front wheels, pneumatic tire size	†4.00—12
Rear wheels, pneumatic tire size	†8—24
Wheelbase	61^{7}_{8} in.
Tread, front (standard—fixed axle with reversible wheels)	43 and 49 in.
Tread, front (adjustable front axle, 4-in. intervals)	39 to 55 in.
Tread, rear (adjustable—reversible wheels and rims, 4-in. intervals)	40 to 56 in.

†*Other pneumatic tire sizes are available.*

General

Length, over all		92 in.
Width, over all—minimum treads		$48\frac{1}{4}$ in.
Width, overall—maximum treads		$64\frac{1}{4}$ in.
Height, overall (to top of steering wheel)		$56\frac{1}{4}$ in.
Ground clearance for crops:	Under front axle	14 in.
	Under rear axle	14 in.
Quick attachable drawbar (adjustable):	Normal height	$12\frac{3}{4}$ in.
	High and low positions	11 and $14\frac{1}{2}$ in.
	Lateral adjustment	$1\frac{3}{8}$ in. on each side of center hole
Fast-Hitch drawbar:	Height above ground	4 to 24 in.
	Lateral movement	$9\frac{1}{2}$ in.
Swinging drawbar	Height above ground	$11\frac{3}{4}$, $13\frac{7}{8}$, $16\frac{1}{4}$ in.
	Lateral adjustment	28 in.
Minimum turning radius with minimum treads:		
	With brake applied	8 ft.

Specifications are subject to change without notice.

INDEX

INDEX

INDEX

INDEX

The Symbol of Quality Products

Backed By A Dealer Organization Equipped To Give You—

Service Where You Need It

District Offices in the United States

Aberdeen, S. Dak.
Albany 4, N. Y.
Amarillo, Tex.
Atlanta 3, Ga.
Baltimore 30, Md.
Billings, Mont.
Birmingham 4, Ala.
Boston 34, Mass.
Broadview, Ill.
Buffalo 5, N. Y.
Charlotte 6, N. C.
Cincinnati 2, Ohio
Columbus 15, Ohio
Dallas 2, Tex.
Davenport, Iowa
Denver 16, Colo.
Des Moines 16, Iowa
Dubuque, Iowa
Evansville 7, Ind.
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Los Angeles 21, Calif.
Louisville, Ky.
Madison 4, Wis.
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Memphis 2, Tenn.
Minneapolis, Minn.
(St. Paul 14, Minn.)
Minot, N. Dak.
Nashville 3, Tenn.
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Oklahoma City, Okla.
Omaha, Nebr.
Peoria, Ill.
Philadelphia 33, Pa.
Pittsburgh 30, Pa.
Portland 32, Oreg.
Quincy, Ill.
Richmond 13, Va.
Saginaw, Mich.
St. Cloud, Minn.
St. Louis, Mo.
(Robertson, Mo.)
St. Paul 14, Minn.
Salt Lake City 4, Utah
San Antonio 6, Tex.
Sioux Falls, S. Dak.
Spokane 10, Wash.
Springfield, Ill.
Syracuse 3, N. Y.
Toledo 1, Ohio
Wichita 2, Kans.

Parts Depots are strategically located at 11 points and Transfer Houses at 8 points in the United States. Ample stocks are maintained at all times to assure prompt shipment to your IH dealer to meet your requirements.

Parts Depots in the United States

Albany 4, N. Y.
Atlanta
(East Point, Ga.)
Baltimore 3, Md.
Broadview, Ill.
Dallas, Tex.
Denver 17, Colo.
Kansas City 15, Kans.
Memphis 6, Tenn.
Portland 8, Oreg.
Richmond 4, Calif.
St. Paul 4, Minn.

Transfer Houses in the United States

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Memphis 6, Tenn.
Moline, Ill.
St. Paul 14, Minn.
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INTERNATIONAL HARVESTER COMPANY
180 NORTH MICHIGAN AVE. CHICAGO 1, ILLINOIS, U.S.A.

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